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U.S. Department
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**National Highway
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*** *** ***

TRANSPORTATION RESEARCH CENTER

Indiana University
Bloomington, Indiana 47403-1599

ON-SITE SCHOOL BUS INVESTIGATION

CASE NO. - 92-10
FLEET - PRIVATE VEHICLE
LOCATION -
ACCIDENT DATE - 1992

Submitted By:

Research Scientist

1992

Revised Submission:

1993

Contract Number: DTNH22-87-C-07169

Prepared for:

U.S. Department of Transportation
National Highway Traffic Safety Administration
National Center for Statistics and Analysis
Washington, D.C. 20590

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The crash investigation process is an inexact science which requires that physical evidence such as skid marks, vehicular damage measurements, and occupant contact points be coupled with the investigator's expert knowledge and experience of vehicle dynamics and occupant kinematics in order to determine the precrash, crash, and post-crash movements of involved vehicles and occupants.

Because each crash is a unique sequence of events, generalized conclusions cannot be made concerning the crashworthiness performance of the involved vehicle(s) or their safety systems.

N O T E

The investigation contained in this report follows the test cylinder placement protocol as presented within the Notice of Proposed Rulemaking (Docket No. 89-26; Notice 2) for Federal Motor Vehicle Safety Standard, Number 111, Rearview Mirrors (Cross View Mirrors on School Buses), published in the Federal Register / Vol. 56, No. 85 / 1991 / Proposed Rules, pages 20171-20183. Subsequent to the completion of this investigation, the Final Rule for Federal Motor Vehicle Safety Standard, Number 111, Rearview Mirrors (Convex Cross View Mirrors on School Buses), was issued and published (Docket No. 89-26; Notice 3) in the Federal Register / Vol. 57, No. 232 / 1992 / Rules and Regulations, pages 57000-57020. Regarding this case report, the number and placement distances of test cylinders at the rear axle were the changes noted from the Notice of Proposed Rule Making to the Final Rule. The Final Rule is presented in Appendix G of this report.

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
TRC/IU Case No. 92-10		

4. Title and Subtitle	5. Report Date
On-Site School Bus Investigation Fleet - Private Vehicle Location -	1992; '93
	6. Performing Organization Code
7. Author(s)	8. Performing Organization Report No.
	TRC/IU 92-10, Task 0085
9. Performing Organization Name and Address Indiana University Transportation Research Center 222 West Second Street Bloomington, Indiana 47403-1599	10. Work Unit No. (TRAIS)
	11. Contract or Grant No. DTNH22-87-C-07169
12. Sponsoring Agency Name and Address U.S. Department of Transportation (NRD-32) National Highway Traffic Safety Administration National Center for Statistics and Analysis Washington, D.C. 20590	13. Type of Report and Period Covered 1992
	14. Sponsoring Agency Code

15. Supplementary Notes

On-site School Bus investigation involving a 1987 GMC 6000 Medium Bus Chassis (body by Carpenter) and a Pedestrian (prior occupant)

16. Abstract

This report covers an on-site investigation of a school bus collision that involved a 1987 GMC 6000 Medium Bus Chassis (body by Carpenter) and a pedestrian. The school bus was traveling south in the southbound lane of a two-lane, undivided State highway. The school bus had stopped in the southbound travel lane along the west side of the roadway. A six-year old female and another child passenger exited the bus. The driver watched the female pedestrian cross the west paved shoulder and go into the gravel driveway of her residence. The driver then looked into the interior rearview mirror to check on seating placement and decorum of the remaining bus passengers (estimated 40-45). Next, the driver looked into the left, outside rearview mirror to check for traffic behind the bus. Noting nothing unusual and believing the forward path was clear, the driver began to accelerate the bus. During the time the driver was checking inside and outside the bus, a gusting wind blew a paper out of the female pedestrian's hands. The pedestrian chased the paper into the southbound travel lane where it eventually stopped near or under the front of the bus. While stooping to retrieve the paper, the pedestrian sensed the bus begin to move forward. She turned and tried to leap toward the west shoulder. The pedestrian was knocked down by the bus and both the right-front tire and the right-rear dual tires passed over the pedestrian. The driver sensed a bump and stopped the vehicle after the rear dual tires had passed over the body. The driver of the bus was uninjured. The pedestrian received a crushed skull (AIS-6), multiple comminuted fractures of the facial bones (AIS-3), and several soft tissue injuries (AIS-1). She was pronounced dead at the scene.

17. Key Words	18. Distribution Statement
School Bus Motor Vehicle Traffic Accident Pedestrian Injury Severity FMVSS 111, Rearview Mirrors	General Public

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	75	

TABLE OF CONTENTS

TRC/IU ON-SITE SCHOOL BUS INVESTIGATION

TRC/IU CASE NO. 92-10

FLEET - PRIVATE VEHICLE
LOCATION -

Summary

This report concerns a motor vehicle accident involving a 1987 GMC 6000 Medium Bus Chassis (body by Carpenter) and a pedestrian (prior bus occupant) occurring on , 1992 at p.m., near ana on a State Road.

The school bus was traveling south in the southbound lane of a two-lane undivided roadway and had stopped in the southbound travel lane along the west side of the roadway to allow two occupants to exit onto the west shoulder. A gusting wind blew a piece of paper out of one of the pedestrian's hands. The pedestrian chased the paper into the southbound travel lane where it eventually stopped under the front of the bus near the left-front tire. While stooping to retrieve the paper, the pedestrian sensed the bus begin to accelerate forward. She turned and tried to leap toward the west shoulder but was impacted by the school bus. The school bus continued southward after impact and came to rest facing south in the southbound lane. The pedestrian was lying prone on the pavement in an east-west direction after impact, with her head pointing west and her feet east.

The center front bumper of the school bus impacted the right side of the pedestrian after she had turned and was trying to leap toward the west shoulder. The bumper pushed the pedestrian down and the right-front tire and right-rear dual tires impacted the head of the pedestrian. CDC and TDC are out-of-scope for this accident; therefore, the CRASHPC reconstruction program was not used.

The 1987 GMC 6000 Medium Bus Chassis (body by Carpenter) was equipped with a driver lap belt at the time of the impact. The driver of the vehicle (41 year-old female) was wearing the available active lap belt. She sustained no injury. The driver of the school bus was listed on the Police Accident Report as not sustaining any injury as a result of this crash. The pedestrian (6 year-old female) was listed on the Police Accident Report as sustaining a "K" (fatal) injury. She sustained a crushed skull, multiple comminuted fractures of the facial bones, and several soft tissue injuries. She was pronounced dead at the scene.

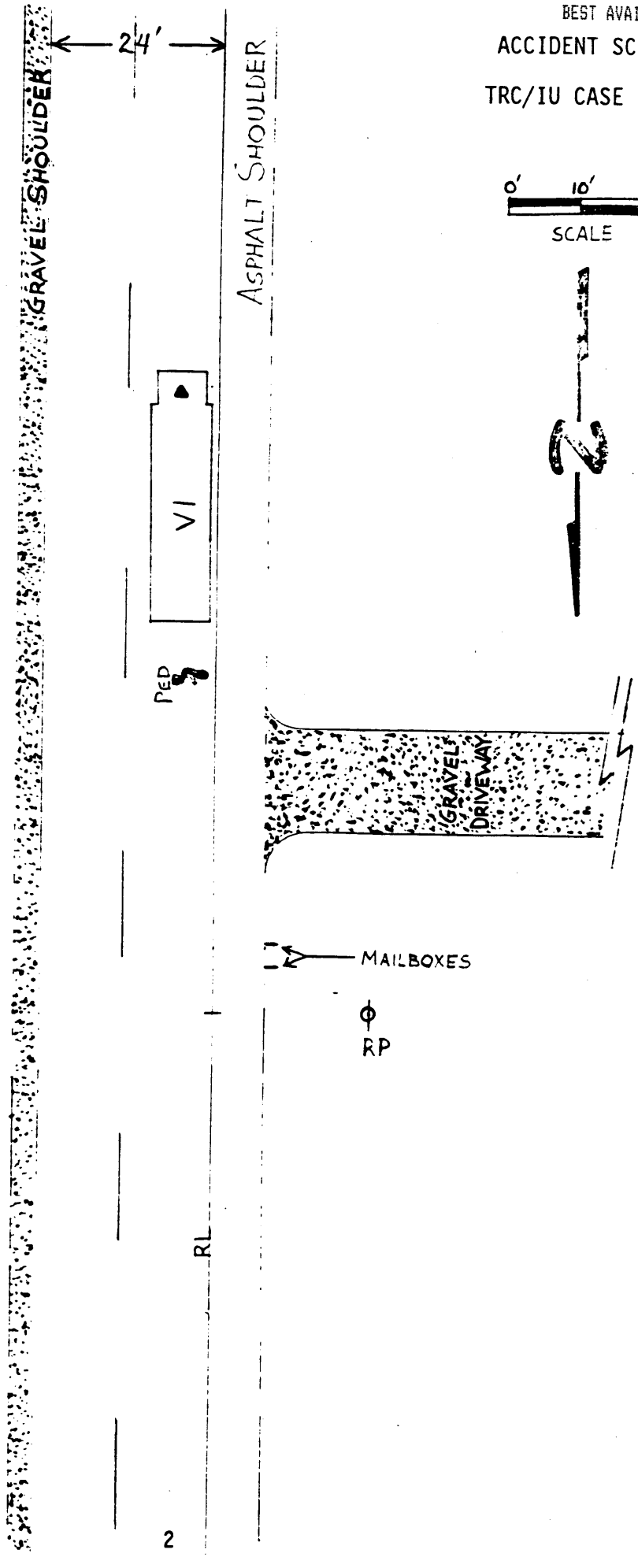
The proposed field-of-view evaluation positions (Test Cylinders A through M) listed in the Federal Register on 1991 are, in our opinion, the minimum field-of-view that should be available to a bus driver.

BEST AVAILABLE

ACCIDENT SCHEMATIC

TRC/IU CASE NO. 92-10

Scale: 1" = 20'
(prior to reduction @ 94%)



TRC/IU ON-SITE SCHOOL BUS INVESTIGATION

TRC/IU CASE NO. 92-10

FLEET - PRIVATE VEHICLE
LOCATION -

ACCIDENT DATA

Location/Street:	State Road
City/Township:	near
Area/Type:	Rural/residential
Accident Date/Time:	1992 @ p.m.
Investigating Police Agency:	County Sheriff Department
Accident Type:	School Bus/Pedestrian - right angle
Occupant Injury Severity (Pedestrian):	Crushed skull (AIS-6)

AMBIENT CONDITIONS

Light conditions:	Daylight
Weather Condition:	Clear
Precipitation:	None
Road Surface:	Dry

ROADWAY

	School Bus
Location:	State road
Number of Travel Lanes:	2-lanes, undivided
Width:	24 feet (7.3 meters)
Surface Type:	Asphalt
Median:	None
Shoulders:	West side: 7.3 feet (2.2 meters) asphalt East side: 3.5 feet (1.1 meters) gravel
Vertical alignment:	Level (approximately 1.0 % grade negative to south)

ROADWAY (CONT'D.)

	School Bus
Horizontal alignment:	Straight
Estimated Coefficient of Friction:	0.60
Traffic Density:	Light (traffic was stopped behind school bus and in the northbound traffic lane)

TRAFFIC CONTROLS

	School Bus
Signals:	None
Signs:	None
Markings:	Single solid white edgeline each side of roadway, single broken yellow centerline
Speed Limit:	55 m.p.h. (89 k.p.h.)

VEHICLES

	School Bus
Year:	1987
Make:	GMC
Model:	6000 medium bus chassis
Body Type:	School bus, 66-passenger, Carpenter body
V.I.N.:	1GDJ6P1B5HV------
Color:	Yellow with black lettering
Mileage:	30,946.5 mi (49,802 km)--at time of crash
Engine:	V-8, 366 ci (6.0 L)
Transmission:	5-speed manual (CL-455), floor mounted
Steering:	Power steering
Brakes:	Hydraulic (GVWR: 25,580)
Padding:	Padded seat backs and tops
Active Restraints:	Manual lap belt (driver only)

VEHICLES (CONT'D.)

	School Bus
Passive Restraints:	None
Defects:	None
Fleet:	Private vehicle
Tow status:	Not towed

VEHICLE DAMAGE

Exterior	School Bus
Event number:	1
Object Struck:	Pedestrian
Damage location	
Damaged Plane:	Front
Vertical Location On Plane:	Bumper
Direct Begins:	No damage visible
Length Direct:	
Field L:	
C_1:	
C_2:	
C_3:	
C_4:	
C_5:	
C_6:	
D:	
Maximum Crush:	
Location:	
CDC or TDC:	Out-of-scope
Damaged Components:	None
Event number:	2
Object Struck:	Pedestrian
Damage location	
Damaged Plane:	Front
Vertical Location On Plane:	Right-front tire
Direct Begins:	No damage visible
Length Direct:	
Field L:	

VEHICLE DAMAGE (CONT'D.)

Exterior (Cont'd.)	School Bus
C_1:	
C_2:	
C_3:	
C_4:	
C_5:	
C_6:	
D:	
Maximum Crush:	
Location:	
CDC or TDC:	Out-of-scope
Damaged Components:	None
Event number:	3
Object Struck:	Pedestrian
Damage location	
Damaged Plane:	Front
Vertical Location	
On Plane:	Right-rear dual tires
Direct Begins:	No damage visible
Length Direct:	
Field L:	
C_1:	
C_2:	
C_3:	
C_4:	
C_5:	
C_6:	
D:	
Maximum Crush:	
Location:	
CDC or TDC:	Out-of-scope
Damaged Components:	None

Interior

Damaged Components:	No damage
Other Evidence of Occupant Contact:	None
Manual Restraint System Failures:	None

VEHICLE DAMAGE (CONT'D.)

Interior (Cont'd.)	School Bus
Seat Performance Failures:	None

Repair

Cost Estimate:	No damage

VEHICLE VELOCITY ESTIMATES

Highest Delta "V"	School Bus
Reconstruction Program:	Out-of-scope
Program Algorithm:	Not applicable
Travel Speed:	5 m.p.h. (8 k.p.h.) or less
Total Delta "V":	Not applicable
Longitudinal Delta "V":	Not applicable
Lateral Delta "V":	Not applicable

COLLISION SEQUENCE

Pre-Crash: The police accident report indicates that the case vehicle (school bus) was traveling south in the southbound lane of a two-lane undivided State Road and had stopped in the southbound travel lane along the west side of the roadway. A six-year old female and another child passenger exited the bus. The driver watched the female pedestrian cross the 7.3 foot (2.2 meter) asphalt west shoulder and go 2-4 feet (0.6-1.2 meters) into the gravel driveway of her residence. The driver then looked into the interior rearview mirror to check on seating placement and decorum of the remaining bus passengers (estimated 40-45). Next, the driver looked into the left, outside rearview mirror to check for traffic behind the bus. Noting nothing unusual and believing the forward path was clear, the driver began to accelerate the bus. The driver of the case vehicle made no pre-crash avoidance maneuvers. The case vehicle continued straight prior to impact.

The police accident report indicates that during the time the driver was checking inside and outside the bus, a gusting wind blew a piece of paper out of the female pedestrian's hands. The pedestrian chased the paper into the southbound travel lane where it eventually stopped under the front of the bus near the left-front tire (i.e., between test cylinders G and H; see

COLLISION SEQUENCE (CONT'D.)

FMVSS 111, Rearview Mirrors). While stooping to retrieve the paper, the pedestrian sensed the bus begin to accelerate forward. She turned and tried to leap toward the west shoulder.

Crash: The police accident report indicates that the center front bumper of the school bus impacted the right side of the pedestrian after she had turned and was trying to leap toward the west shoulder. The bumper pushed the pedestrian down and the right-front tire and right-rear dual tires impacted the head of the pedestrian. As the school bus was accelerating, the driver sensed a bump and immediately applied the brakes. The bus traveled approximately 45 feet (13.7 meters) from stopped position, acceleration, and braking to a post-crash stop [i.e., 2.5 foot (76 centimeter) front overhang, 21.2 foot (646 centimeter) wheelbase, and 21 feet (6.4 meters) from rear axle to body].

Post-Crash:

Occupants: The police accident report indicates that when the school bus driver sensed the "bump", she "knew what had happened". The driver: (1) stopped the bus, (2) took it out of gear, (3) detached her lap belt, (4) went to the rear of the bus and saw the pedestrian, and (5) returned to the bus and called for assistance on her radio. Police photographs show that the pedestrian was lying prone on the pavement in an east-west direction after impact, with her head pointing west and her feet east. Police measurements indicated that the center of her torso was three feet (0.9 meters) from the west roadway edge.

Police: The investigating police agency was notified of the accident almost immediately (i.e., at [redacted] p.m.) and arrived on-scene within three minutes. Traffic control procedures were established and emergency medical services and the coroner were called to assist.

Rescue: The pedestrian was pronounced dead at the scene by a deputy County coroner and was transported by ambulance to a medical facility where skull x-rays were taken.

Removal: Following the police investigation, the case vehicle was driven from the scene.

HUMAN FACTORS/OCCUPANT DATA

	School Bus	Pedestrian
Driver:	41 year-old female	6 year-old female
Height:	62 in (157 cm)	Unknown
Weight:	125 lb (57 kg)	Unknown

HUMAN FACTORS/OCCUPANT DATA (CONT'D.)

	School Bus	Pedestrian
Occupation:	School bus driver	Student
Active Restraint System/Usage:	2-point lap/used	Not applicable
Usage Source:	Police Accident Report	Not applicable
Eye glasses/contacts:	None	Unknown
Experience driving school buses (total experience):	Eleven years, full time driver the last 5 years	Not applicable
Vehicle Familiarity:	Approximately 5 years	Not applicable
Route Familiarity:	Daily	Daily
Trip Plan:	Complete school bus route	School to home
Manner of Leaving Scene:	Unknown	Ambulance
Type of Medical Treatment:	None	None

DRIVER INJURIES

Injury	Severity (OIC/AIS)	Source
None	Not applicable	Not applicable

PEDESTRIAN INJURIES

Injury	Severity (OIC/AIS)	Source
Crushed skull	HWNW-6	Tire(s) RF and/or RR
Comminuted fractures of facial bones	FWFS-3	Tire(s) RF and/or RR
Contusion shoulder	SUCI-1	Tire(s) RF and/or RR
Laceration shoulder	SULI-1	Tire(s) RF and/or RR
Contusion arm	XUCI-1	Tire(s) RF and/or RR
Laceration arm	XULI-1	Tire(s) RF and/or RR

FEDERAL MOTOR VEHICLE SAFETY STANDARD 111, REARVIEW MIRRORS

The four frontal convex mirrors all had 8-inch (20-centimeter) diameter, circular reflective surfaces. The center of the front-right, side, convex mirror (i.e., aimed along the right side of the bus) was 61 inches (155 centimeters) off the ground, two inches (5 centimeters) inward from the longitudinal vertical plane tangent to the right side of the bus, and 5 inches (13 centimeters) rearward of the transverse vertical plane tangent to the front bumper. The

FEDERAL MOTOR VEHICLE SAFETY STANDARD 111, REARVIEW MIRRORS (CONT'D.)

center of the front-right, crossover, convex mirror (i.e., aimed across the frontal plane of the bus) was 57.75 inches (147 centimeters) off the ground, 6.5 inches (17 centimeters) inward from the longitudinal vertical plane tangent to the right side of the bus, and 2 inches (5 centimeters) rearward of the transverse vertical plane tangent to the front bumper. The center of the front-left, side, convex mirror (i.e., aimed along the left side of the bus) was 53.75 inches (137 centimeters) off the ground, 0.5 inches (1 centimeter) outward from the longitudinal vertical plane tangent to the left side of the bus, and 2.5 inches (6 centimeters) rearward of the transverse vertical plane tangent to the front bumper. The center of the front-left, crossover, convex mirror (i.e., aimed across the frontal plane of the bus) was 54.5 inches (138 centimeters) off the ground, 5.5 inches (14 centimeters) inward from the longitudinal vertical plane tangent to the left side of the bus, and 5.75 inches (15 centimeters) forward of the transverse vertical plane tangent to the front bumper. It is unknown if any outside mirrors had been adjusted during the three weeks since the accident.

TRC investigators constructed the fourteen-cylinder School Bus Field-of-View Test as depicted on page 20181 of the *Federal Register / Vol. 56, No. 85 / 1991 / Proposed Rules* and shown schematically on page 11 of this report. The cone at position N was approximately 3 feet (0.9 meters) high. Cones at positions G and I were approximately 1 foot (30 centimeters) high and 8.5 inches (22 centimeters) square while the remaining eleven were approximately 9 inches (23 centimeters) high and 6 inches (15 centimeters) in diameter at the base. The standard calls for the Test Cylinders to be one foot high (30 centimeters) and one foot (30 centimeters) in diameter at the base. An "extended yardstick"--48 inches (122 centimeters) high and visible in slides numbered 1-4, 11, and 12 (shown closeup in slides 11 and 12), is used for perspective and for recording the top and bottom heights of the front bumper.

A cone [9 inches (23 centimeters) high and 6 inches (15 centimeters) in diameter at the base] representing the pedestrian--near the transverse vertical plane of the front bumper and aligned with the right-front tire, can be seen in slides 18 and 19. This cone cannot be seen in slides 15, 17, or 20-23; however, the intent of this cone was only to approximate the pedestrian's position and not her actual height. The pedestrian's height is unknown, and according to the police accident report, she was not fully erect just prior to or at impact.

Cones I-F-C can be seen in slide 17. Cones G-D-A and E-B can be seen in slides 21 and 22, as can cones L-M-N. Cone H (center-front) cannot be seen in any slide, nor can cones J or K [two feet (0.6 meters) outboard of the left and right front bumper ends respectively and centered in the transverse vertical plane through the front axle].

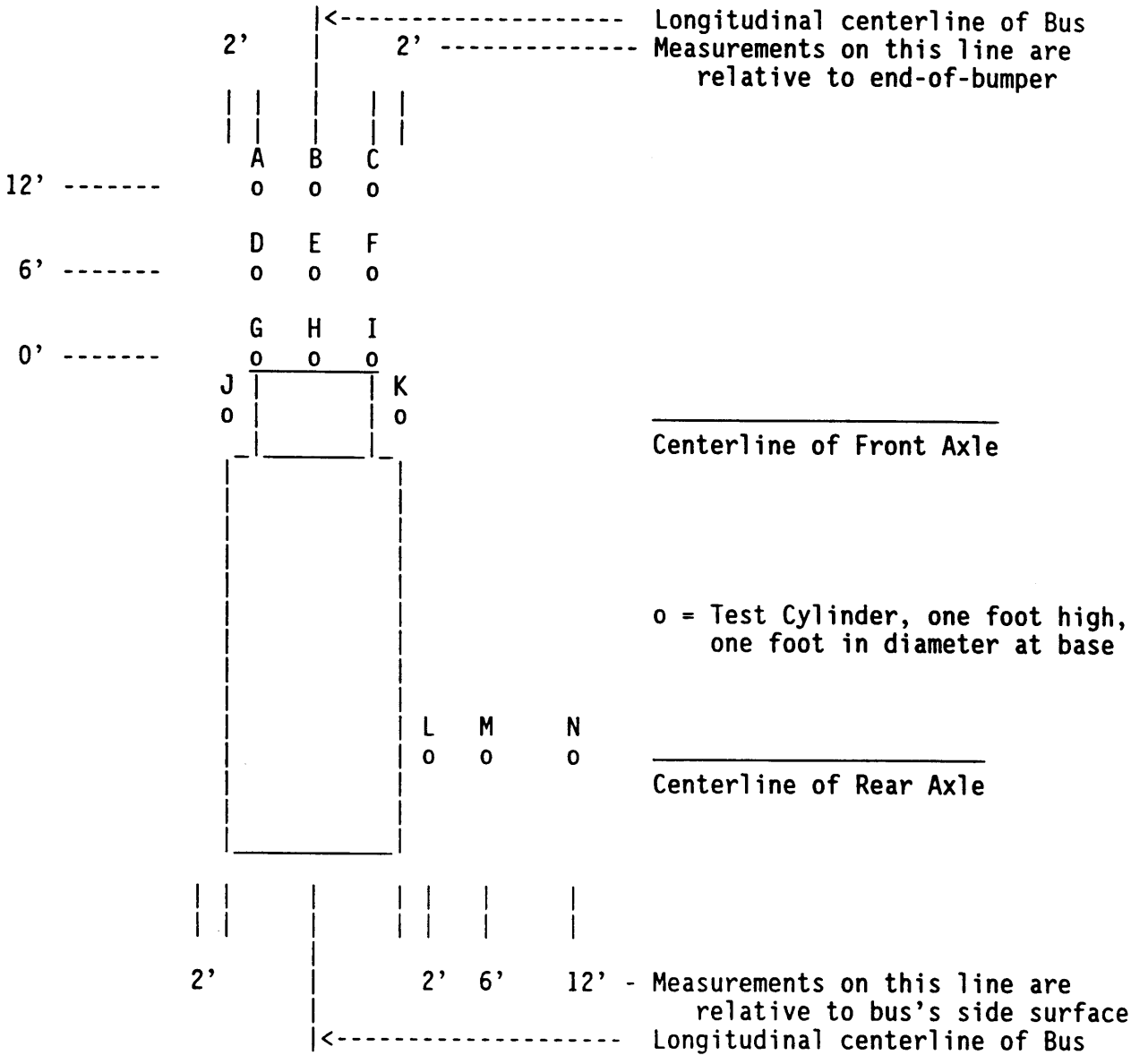
The height of the photographer was considerably taller than the driver [approximately 72 inches (183 centimeters) versus 62 inches (157 centimeters)]. No attempt was made to photograph the cones from the driver's position in accordance with all of the requirements spelled out in the proposed standard (i.e., seat centered in the longitudinal seat track, seat adjusted to its lowest vertical position, eye height 27 inches above the junction of the seat back and seat bottom, etc.).

FEDERAL MOTOR VEHICLE SAFETY STANDARD 111, REARVIEW MIRRORS (CONT'D.)

Location of Test Cylinders for School Bus Field-of-View Test

Based Upon: Figure 2: Federal Register/Vol.56,No.85/ 1991

The schematic which follows is a more accurate depiction of the Test Cylinder locations.



FEDERAL MOTOR VEHICLE SAFETY STANDARD 111, REARVIEW MIRRORS (CONT'D.)

In our opinion, both left and right outside, unit magnification (i.e., System A) mirrors and all four outside, convex, rearview mirrors could have been better adjusted. Cones H, J, and K could not be seen in any mirror. Having said that and considering the accident's scenario and other information collected during this investigation, there is a high probability that properly adjusted outside, convex, rearview mirrors (i.e., proposed System B) would not have prevented this fatal collision. The police accident report indicates that the driver: (1) watched the pedestrian enter her driveway; (2) checked the interior, rearview mirror for seating placement and decorum of the remaining bus passengers (estimated 40-45); (3) checked the left, outside, rearview, unit magnification mirror for traffic behind the bus while simultaneously shifting the bus into first gear; (4) and began to accelerate while simultaneously returning her attention and vision forward. There was no expectation on the driver's part or indication heard by the driver (i.e., the police accident report indicates that the driver never heard the vehicle horns blown by witnessing motorists) that a pedestrian had entered the roadway immediately in front of the school bus.

In our opinion, there are "blind spots" in this school bus driver's field-of-view. Of greatest importance in this fatal collision is the "blind spot" near Test Cylinder position H that is due to improper front-right, crossover, convex and front-left, crossover, convex mirror adjustments. There are also "blind spots" near Test Cylinder positions J (between the driver's window and left-front bumper corner) and K (i.e., between the right-side exit door and the right-front bumper corner). There is also a "blind spot" near Test Cylinder position L between the right side of the bus and the test cylinder that is due both to improper front-right, side, convex mirror and right, outside, rearview, unit magnification mirror adjustment.

In our opinion, the requirement contained in the proposed standard that Test Cylinders J and K be visible in the cross view mirrors (System B) and that System A and System B mirrors must overlap in their fields-of-view along the sides of the school bus are good proposals. However, it is only slightly possible that the improved field-of-view available in the proposed System B mirrors would have enabled the driver to have seen this pedestrian as her eyes moved from the left, outside, rearview, unit magnification mirror to the roadway ahead.

Recommendations:

1. Proposed changes to FMVSS 111, Rearview Mirrors (Cross View Mirrors on School Buses) should be implemented as soon as possible.

2. To our knowledge, little or no consideration has been given to identifying the or a responsible party for conducting the School Bus Field-of-View Test. Owner-operators and school corporations are the obvious candidates for mirror adjustment responsibilities.

   Possible problem areas are the identification of a compliance authority and the timing of the compliance check. In the Police conduct an annual school bus safety check. Some owner-operators could receive the Field-of-View Test during this late summer safety inspection, but school corporations and owner-operators with multiple buses

FEDERAL MOTOR VEHICLE SAFETY STANDARD 111, REARVIEW MIRRORS (CONT'D.)

may not have hired or assigned specific individuals to specific buses at the time of those inspections. The test itself could also significantly lengthen the inspection time.

It may not be in the best interests of pupil transportation safety to rely on owner-operators and school corporations to properly adjust school bus outside rearview and cross view mirrors.

3. A renewed and increased emphasis should be assigned to the pupil school bus safety education program component directed towards prohibition of either (1) reentering the roadway for any reason in front of the school bus after exiting the school bus to the right or (2) crossing back in front of the school bus after having crossed in front of it to the left.

SELECTED PRINTS

A total of forty-two prints are presented. Prints numbered 1 through 8 were taken and made available by the County Sheriff Department. Prints numbered 9 through 42 were taken by the Transportation Research Center.

01 -- 1992

TRC/IU: 92-10, Task: 0085
MCSD-School bus front & left

02 -- 1992

TRC/IU: 92-10, Task: 0085
MCSD-Front & right & victim

03 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
MCSD-Rear & right & victim

04 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
MCSD-Rear & victim & R tires

05 -- [redacted] 1992

[redacted]

TRC/IU: 92-10, Task: 0085
MCSD-Ped's path of travel

06 -- [redacted] 1992

[redacted]

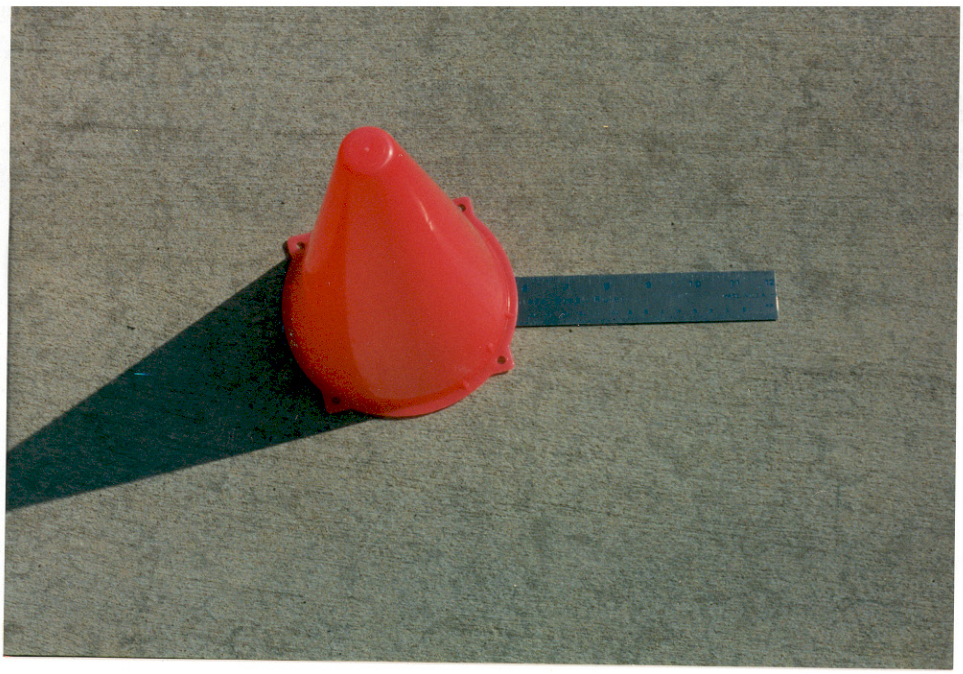
TRC/IU: 92-10, Task: 0085
MCSD-Rear & left & victim

07 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
MCSD-Look back @ ped's path

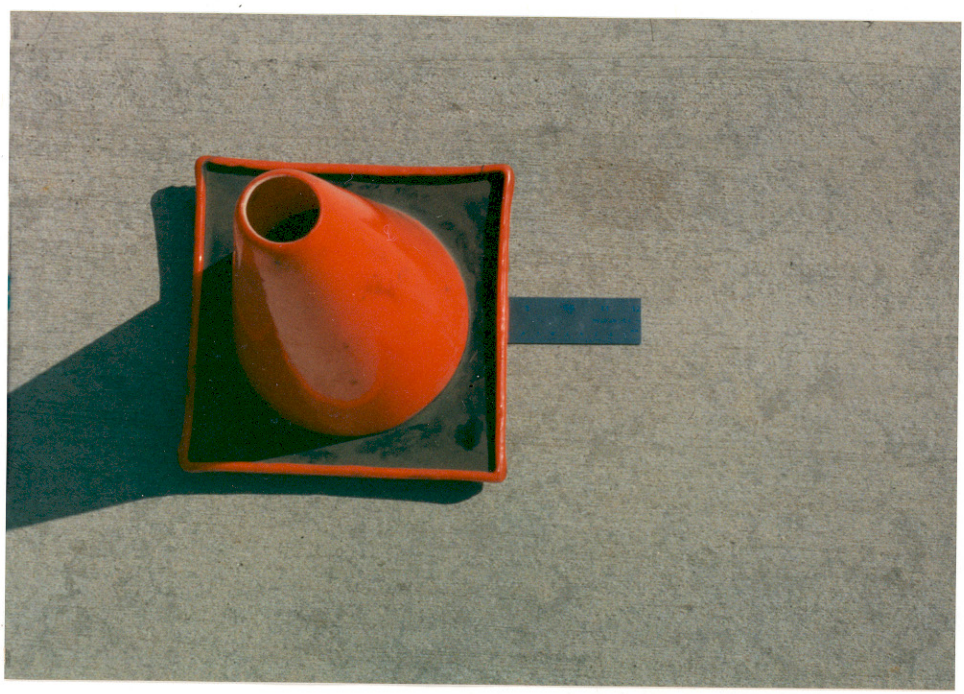
08 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
MCSD-Left side bus & victim



09 --. 1992

TRC/IU: 92-10, Task: 0085
Width of cones: A-F,H,J-M



10 -- 1992

TRC/IU: 92-10, Task: 0085
Width of cones: G,I

11 -- 1992

TRC/IU: 92-10, Task: 0085
Height of cones: A-G,H,J-M

12 -- 1992

TRC/IU: 92-10, Task: 0085
Height of cones: G,I

13 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
School Bus & Cones: A,D,G

14 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
School Bus & Cones: B,E,H

15 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
School Bus & Cones: C,F,I

16 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
Front and right sides

17 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
School Bus & Cones: D-F

18 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
School Bus & Cones: G-I & K

19 -- 1992

TRC/IU: 92-10, Task: 0085
Right and rear sides

20 -- 1992

TRC/IU: 92-10, Task: 0085
Rear of School Bus

#_21 -- 1992

TRC/IU: 92-10, Task: 0085
Rear and left sides

22 -- 1992

TRC/IU: 92-10, Task: 0085
Across bumper from left

23 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
Height of top of bumper

24 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
Height of bottom of bumper

25 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
L outside rearview mirror

26 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
Closeup L outside RV mirror

27 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
Left side convex mirrors

28 - [redacted] 1992

TRC/IU: 92-10, Task: 0085
Closeup L side convex mirror

29 -- 1992

TRC/IU: 92-10, Task: 0085
Closeup L crossview mirror

30 -- 1992

TRC/IU: 92-10, Task: 0085
Right side convex mirrors

31 -- [redacted] 1992

TRC/IU: 92-10, Task: 008[illegible]
Cone K is not visible

32 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
Closeup R crossview mirror

33 -- 1992

TRC/IU: 92-10, Task: 0085
Closeup R side convex mirror

34 -- 1992

TRC/IU: 92-10, Task: 0085
R outside rearview mirror

35 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
Closeup R outside RV mirror

36 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
Cone representing pedestrian

37 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
Inside rearview mirror

38 -- [redacted] 1992

TRC/IU: 92-10, Task: 0085
Lookback @ impact & approach

39 -- 1992

TRC/IU: 92-10, Task: 0085
Bus approach direction

40 -- 1992

TRC/IU: 92-10, Task: 0085
Impact @ far side driveway

41 -- 1992

TRC/IU: 92-10, Task: 0085
Driveway & impact looking SW

42 -- 1992

TRC/IU: 92-10, Task: 0085
Opposite pedestrian's path

SLIDE INDEX

SLIDE INDEX

Slide No.	Description	Direction
NOTE:	The fourteen orange sport cones visible in slides 1-10 follow the placement protocol as presented within the Notice of Proposed Rulemaking (Docket No. 89-26; Notice 2) for Federal Motor Vehicle Safety Standard, Number 111, Rearview Mirrors (Cross View Mirrors on School Buses), published in the Federal Register / Vol. 56, No. 85 / 1991 / Proposed Rules, pages 20171-20183.	
NOTE:	55 mm camera lens depicts "normal" eye field of vision; 135 mm camera lens provides approximately 2.5 power magnification	
1-10	Exterior of Case Vehicle in a clockwise direction: front, right side, rear, and left side	
11-12	Case Vehicle front bumper height at top [34 in (86 cm)] and bottom [21.25 in (54 cm)]	
13	Case Vehicle's left, outside, rearview, unit magnification mirror; slide taken with 55 mm camera lens. Note: amount of sky visible at top of mirror and lack of ground view at bottom of mirror, plus partial obstruction by mirror bracket on left side and narrow field of view along left side.	
14	Case Vehicle's left, outside, rearview, unit magnification mirror; slide taken with 135 mm camera lens	
15-19	NOTE: Cone H cannot be seen in any of the slides containing the front-left, double convex mirrors of the Case Vehicle	
15	Case Vehicle's front-left, double convex mirrors; slide taken with 55 mm camera lens. Note: bottom of front-left, crossover mirror is obstructed by the front-left of the bus's hood; however, cones I, F, and C can be seen in the mirror.	
16	Case Vehicle's front-left, left-side, convex mirror; slide taken with 135 mm camera lens	
17	Case Vehicle's front-left, crossover, convex mirror; slide taken with 135 mm camera lens. Note: cones I, F, and C are visible.	
18-19	Case Vehicle's front-left, left-side, convex mirror and front-left, crossover, convex mirror; slides taken with 135 mm camera lens. Note:	

SLIDE INDEX

Slide No.	Description	Direction
18-19 (Cont'd.)	a cone representing the pedestrian was placed between cones H and I and directly in front of the right-front tire; the pedestrian cone was placed close to the transverse vertical plane tangent with the front bumper.	
20-23	NOTE: Cone H cannot be seen in any of the slides containing the front-right, double convex mirrors of the Case Vehicle	
20	Case Vehicle's front-right, double convex mirrors; slide taken with 55 mm camera lens. Note: bottom of front-right, crossover mirror is obstructed by the front-right of the bus's hood; however, cones G, D, A, E, and B can be seen in the mirror; the open right-side door obscures cone L, but cones M and N can be seen.	
21	Case Vehicle's front-right, crossover, convex mirror; slide taken with 135 mm camera lens. Note: cones G, D, A, E, and B are visible.	
22	Case Vehicle's front-right, right-side, convex mirror; slide taken with 135 mm camera lens. Note: cones L, M, and N are visible.	
23	Case Vehicle's front-right, right-side, convex mirror; slide taken with 135 mm camera lens. Note: a 4-foot (1.2 meter) "yardstick" being held atop cone K, which cannot otherwise be seen.	
24	Case Vehicle's right, outside, rearview, unit magnification mirror; slide taken with 55 mm camera lens. Note: partial obstruction of mirror's right side by bus's right A-pillar; plus, no ground can be seen until rear of bus.	
25	Case Vehicle's right, outside, rearview, unit magnification mirror; slide taken with 135 mm camera lens	
26	Case Vehicle's interior, rearview mirror	

IN 9210 #1
Best Available

IN 9210 #2
Best Available

IN 9210 #3
Best Available

IN 9210 #4
Best Available

IN 9210 #5
Best Available

IN 9210 #6
Best Available

IN 9210 #7

IN 9210 #8

IN 9210 #9

IN 9210 #10
Best Available

IN 9210 #11
Best Available

IN 9210 #12
Best Available

IN 9210 #13

IN 9210 #14

IN9210 #15

IN 9210 #16

IN 9210 #17

IN 9210 #18

IN 9210 #19

IN 9210 #20

IN 9210 #21

IN 9210 #22

IN 9210 #23

IN 9210 #24

IN 9210 #25

IN 9210 #26

ACCIDENT COLLISION MEASUREMENT TABLE

U.S. Department of Transportation
National Highway Traffic Safety Administration

ACCIDENT COLLISION MEASUREMENT TABLE

BEST AVAILABLE

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

Primary Sampling Unit Number 1 0 | Case Number—Stratum 9 2 1 0

ACCIDENT COLLISION DIAGRAM

LEVEL I
PHYSICAL EVIDENCE ABSENT

To be accomplished when there is no physical evidence present at the scene:

- approximate vehicle orientation at impact and final rest
- applicable road/roadway delineation (e.g., curbs/edge lines, lane markings, median markings, pavement markings, etc.)
- applicable traffic controls (e.g., speed limit)
- north arrow placed on diagram
- sketch required

LEVEL II
PHYSICAL EVIDENCE PRESENT

In addition to the level I tasks noted above, the following must be accomplished when physical evidence is present:

- document reference point and reference line relative to physical features present at the scene
- scale documentation of all accident induced physical evidence
- scaled documentation of all roadside objects contacted
- roadway surface type and condition of applicable roadways
- grade measurements for all applicable roadways and at location of rollover initiation
- scaled representations of the vehicle(s) at pre-impact, impact, and final rest based upon either:
  - a) physical evidence, or
  - b) reconstructed accident dynamics

CRASH DATA

	VEH. #1	VEH. #2	VEH. #3
Heading Angle	N/A		
Surface Type	ASPHALT		
Surface Condition	TRAVELED		
Grade (v/h) Measurement (between impact and final rest)	LEVEL (< 2%)		
Grade (v/h) Measurement (at location of rollover initiation)	N/A		

Reference Point: UTILITY POLE JUST NORTH OF RESIDENCE 21.8' W OF RL

Reference line: WEST PAVEMENT EDGE

Item	Distance and Direction from Reference Point	Distance and Direction from Reference Line
EAST SHOULDER, GRAVEL, 3.5'		
ROAD WIDTH, E-W, CENTERLINE 11.4', W EDGE 24.0', W ASPHALT SHOULDER 31.3'		
MAILBOX POST #1	6.2' S	8.3' W
MAILBOX POST #2	9.9' S	8.3' W
NORTH TURN APRON, GRAVEL DRIVE	20.0' S	7.3' W
NORTH SIDE GRAVEL DRIVE	25.5' S	
NORTHEAST CORNER OF HOUSE	25.5' S (POLICE RP)	
SOUTH SIDE GRAVEL DRIVE	40.3' S	
SOUTH TURN APRON, GRAVEL DRIVE	43.0' S	7.3' W
ESTIMATED Cf = 0.6, STRAIGHT, ≈1% GRADE NEGATIVE TO SOUTH		
SSW EDGELINES EACH SIDE, SBY CENTERLINE		

HS Form 431A (1/92)

Appendix A:

Police Accident Report

OFFICER'S STANDARD ACCIDENT REPORT

State Form

Mail to:

OFFICE USE ONLY

Accident I.D. No.

1. Prim. 17 / V1 / V1 / V2 / V2

7. 2

LOCATION

Date of Accident MONTH	DAY	YEAR	Day of Week	Actual Local Time		No. Motor Vehicles	No. Injured	No. Dead	No. Trailers
		1992			☐ AM ☒ PM	1	0	1	0

8. 7

County		Township		City/Town or Nearest City/Town	

Inside Corporate Limits? ☐ Yes ☒ No — Property? ☐ Private ☐ DNR ☒ Other — Distance and Direction From Corporate Limits: ____ Miles North 1 Miles South ____ Miles East ____ Miles West

2. V1 14 / V2

9. 2

Road Accident Occurred On		Intersecting Road/Mile Marker/Interchange	

If not at Intersection, number of feet from	Direction	Nearest Intersecting Road/Mile Marker/Interchange	
250	North		

DRIVER 1

3. V1 2 / V1 / V1 / V2 / V2 / V2

Driver's Name (Last, First, MI): [redacted]

Address (Street, City, State, Zip): [redacted]

Apparent Phys. Stat (enter no.)	Sex	Date of Birth MONTH	DAY	YEAR	Arrested?
1	F	[redacted]		41	☐ Yes ☒ No

Driver's License No.	Lic. Type	Lic. St.	Restr.
[redacted]			/

DRIVER 2

10. 2

Driver's Name (Last, First, MI):

Address (Street, City, State, Zip):

Apparent Phys. Stat (enter no.)	Sex	Date of Birth MONTH	DAY	YEAR	Arrested?
					☐ Yes ☐ No

11. 1

Driver's License No.	Lic. Type	Lic. St.	Restr.

VEHICLE 1

Color	Veh. Yr.	Make	Model Name
Yellow	1987	GMC	6000

Veh. Type (enter no.)	Lic. Yr.	License No.	Lic. State
10	1992	[redacted]	

Veh. Use (enter no.)	Speed Limit	Fuel Tax No.
4	55	

Direction of Travel	No. Occupants	Fire?	No. Axles	Transporting Hazardous Mat.
South	UNK	☐ Yes ☒ No	2	☐ Yes ☒ No

Towed To	Towed By

Registered Owner's Name (Last, First, MI): [redacted]

Address (Street, City, State, Zip): [redacted]

VEHICLE 2

12. 1

Color	Veh. Yr.	Make	Model Name

Veh. Type (enter no.)	Lic. Yr.	License No.	Lic. State

13. 2

Veh. Use (enter no.)	Speed Limit	Fuel Tax No.

14. 1

Direction of Travel	No. Occupants	Fire?	No. Axles	Transporting Hazardous Mat.
		☐ Yes ☐ No		☐ Yes ☐ No

Towed To	Towed By

Registered Owner's Name (Last, First, MI):

15. 1

Address (Street, City, State, Zip):

TRAILER 1

6.

Registered Owner's Name (Last, First, MI):

Address (Street, City, State, Zip):

License No.	Make	Year	Lic. St.	Lic. Yr.

TRAILER 2

15A. 2

Registered Owner's Name (Last, First, MI):

Address (Street, City, State, Zip):

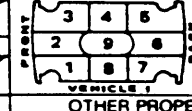
License No.	Make	Year	Lic. St.	Lic. Yr.

DAMAGE

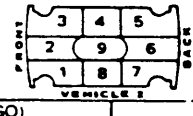
INITIAL IMPACT V1	INITIAL IMPACT V2
10	

DAMAGE EST V1	DAMAGE EST V2
1	

Areas Damaged (Multiples)



10 - Undercarriage
11 - Trailer
12 - None



10 11 12

OTHER PROPERTY (INCLUDE CARGO)

Name of Object	OWNER'S NAME AND ADDRESS	Damage Est (use chart)

PEDESTRIAN

Direction	Street/Highway	Arrested?	Apparent Phys. Stat. (enter no.)
East		☒ Yes ☐ No	1

What was pedestrian doing before accident? Enter No. 9

1 Not in roadway
2 Standing in roadway
3 Playing in roadway
4 Pushing or working on vehicle
5 Other working in roadway
6 Walking in roadway with traffic
7 Walking in roadway against traffic
8 Getting on or off vehicle
9 Getting on or off school bus
10 Crossing or entering not at intersection
11 Crossing or entering at intersection
12 Other

Pedestrian Traffic Control? ☐ Yes ☒ No

16	17	18.	18A	19.	20	21	22	23.	24.	25.	26.	27.	28.	29.
[redacted]		U	/	1	DRIVER OF VEHICLE 1 (as listed above)					[redacted]		2	3	.00%
					DRIVER OF VEHICLE 2 (as listed above)									
P	/	/	/	/	DOB/ [redacted] 6	K	8	5	6		6	F	1	

Diagram

Indicate NORTH by an arrow

See attached scale diagram

NARRATIVE (Refer to Vehicle by Number)

Vehicle #1, a school bus, had stopped on St Rd [redacted] The pedestrian exited vehicle #1 and started up the drive to her residence. Pedestrian was carrying papers in her hand and a gust of wind blew them into the roadway. She ran after the papers into the roadway. Vehicle #1 proceeded southbound on St Rd [redacted] and ran over the pedestrian. Both the front and rear wheels ran over the pedestrian.

D1 Insured By [redacted]

D2 Insured By

Other Participant(s) Name, Address (etc.)
Witnesses- [redacted]

Name of Witness No. 1 [redacted]

Address [redacted]

Location at Time of Accident
Infront of Vehicle #1

Location at Time of Accident
In front yard

Name of Person Arrested

I.C. Code(s)

Name of Person Arrested

I.C. Code(s)

INVESTIGATION

Time Notified: [ ] AM [X] PM

Time Arrived: [ ] AM [X] PM

Other Location of Investigation: [redacted] Hospital

Investigation Complete: [X] Yes [ ] No

Photos Taken: [redacted] [X] Yes [ ] No

Assisting Officer: [redacted]

Agency: County Sheriff

Date of Report: 92

Assisting Officer: [redacted]

I.D. No. [redacted]

Agency: Town Marshall

Driver Report Form Furnished: [ ] D1 [ ] D2

Investigating Officer's Signature: [redacted]

I.D. No. [redacted]

Agency: COunty Sheriff

Fatal Traffic Accident

1992 [redacted] PM

Measurements

Reference point #1- Northeast corner of residence located at [redacted] St Rd [redacted]

Reference point #2- 86'10" east from reference point #1 to the west edge of St Rd [redacted]

School bus-	Right rear duals	41' 1" South	1' 0" East
	Right front tire	62' 4" South	1' 1" East
Body- center of torso		20' 2" South	3' 0" East
North driveway culvert		2' 0" North	14' 0" West
South driveway culvert		17' 0" South	13' 9" West

Action Taken

3:33	Ptl. [redacted] dispatched to the accident
3:36	Marshall [redacted] arrives
3:36	Marshall [redacted] requests a coroner
3:44	Ptl. [redacted] arrives
3:49	Sgt. [redacted] arrives
3:53	Inv. [redacted] arrives
4:01	Sheriff [redacted] Arrives
4:07	Ptl. [redacted] arrives
4:21	Ptl. [redacted] arrives

[redacted] locates, interviews and take statements from witnesses
[redacted] phtographs the scene
[redacted] measures the accident scene
[redacted] completes a scale diagram
[redacted] notifies victim's father
[redacted] inspect vehicle #1.
[redacted] conducts followup work at [redacted] Hospital

AFTER ACCIDENT SITUATION

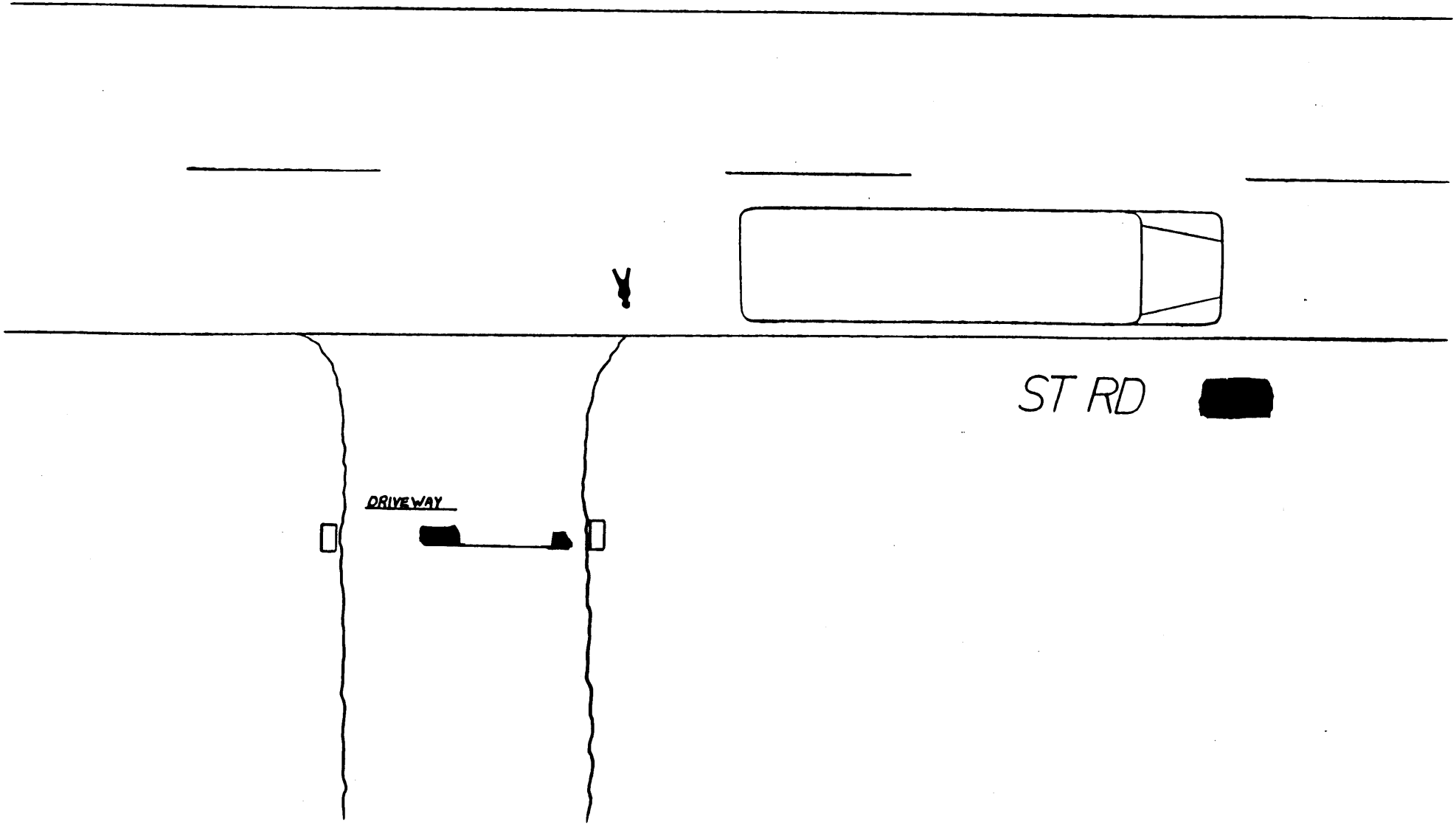
1992 [redacted] P.M.

SGT. [redacted]

0 5 10

SCALE

N



Fatal Traffic Accident

1992 PM

[redacted] Rd [redacted]

Information- Vehicle #1

1987 GMC School Bus
Carpenter Body
VIN/ 1GDJ6P1B5HV[redacted]
Body Serial/ [redacted]

Chassis Manufacture date/ 1987
Body Manufacture date/ 1987

Engine Size/ 366CI/ V8
Transmission/ 5-speed manual CL-455

Odometer reading 30,946.5

1992 registration [redacted]
Registered owner: [redacted]

Operated through [redacted] School Corporation
[redacted] Street

Insurance company/ [redacted]

A school bus safety inspection was completed by the State Police on this bus on [redacted]. The bus passed inspection with no equipment or mechanical defects noted. All lights and emergecny equipment were inspected after the accident and were in workign order. The bus was equipped with two outside rearview mirrors on each side of the windshield. Two convex mirrors were located on each front corner of the bus allowing sight along each side of the bus and acros: the front.

Driver- Vehicle #1

[redacted]
DOB/ [redacted]
Public Passenger License [redacted]
Commercial Driver's License Class A-P
School Bus License certification [redacted]

Medical examination completed on [redacted] by [redacted] M.D.

An alco-sensor test was conducted by Sgt. [redacted] at [redacted]PM at the scene and showed a blood-alcohol level of .00%.

Traffic Accident '92 [redacted] St. Road [redacted]

Action Taken: I was requested to meet with accident team members at the above location reference a fatal accident. Arriving at the scene I spoke briefly with Chief of Police [redacted]. He stated that a school bus driver had stopped at the above location and let two children off. According the Chief, the driver of the bus did not see one of the children come back into the roadway to get a loose piece of paper that had been dropped. The bus was pulling away and ran over the child.

After speaking briefly to the Chief I took 24 frames of black and white photos of the accident scene. I then assisted officer [redacted] in taking measurments of the scene.

After assisting with measurments, I then assisted Sgt. [redacted] in obtaining tire information from the school bus.

I then checked the inside of the school bus. The bus was clean, and no damage noted to the interior. There were four windows partially down on the driver's side of the bus. Counting back from the driver's window, numbers 3, 4, 5, and 7. The emergency exits were located six seats back from driver's seat, on both sides of the bus.

Tire information: Left front and Right front tires/ Kum Ho-9.00-20

Left rear duals/ Regroovable-9.00-20,both same name and size.

Right rear duals/ Road grip Supertread 9.00-20, both same name and size.

All tires appeared to be properly inflated, and had good to excellent tread.

Outside check of bus: The bus was clean and free of any damage or rust. The windows and winshield were also clean, and free of any obstructions. The mirrors were also clean and appeared to be in the proper positions.

School bus: The vehicle is a Carpenter School Bus, yellow and black in color. The bus had been designated number [redacted] on the side, and is part of the [redacted] School Corporation, also noted on sides. Plate number [redacted] The flashing lights and signal were checked and were working properly. The bus has a five speed manual transmission, and the odometer showed 30946.5 miles.

DATE 1998 BEST AVAILABLE PAGE 1

THIS IS DETECTIVE [redacted] OF [redacted] COUNTY SHERIFF'S DEPARTMENT. IT'S SEPTEMBER THE [redacted] 1998. IT'S [redacted] MINUTES AFTER [redacted]. WE'RE AT [redacted] IS THAT CORRECT MRS. [redacted]

[redacted]: YES

[redacted]: I'M AT [redacted] RESIDENCE AND [redacted] WOULD YOU GIVE ME YOUR FULL NAME PLEASE?

[redacted]: [redacted]

[redacted]: AND YOUR DATE OF BIRTH?

[redacted]: [redacted] 44

[redacted]: OKAY, AND YOUR ADDRESS?

[redacted]: [redacted]

[redacted]: AND YOUR PHONE NUMBER?

[redacted]: [redacted]

[redacted]: [redacted] WE'RE HERE TALKING ABOUT AN ACCIDENT THAT YOU WERE INVOLVED IN A COUPLE OF DAYS AGO. UH, I TOLD YOU THAT I WANTED TO ASK YOU A FEW QUESTIONS AND GET IT ON TAPE. IS THAT CORRECT?

[redacted]: YES

[redacted]: ALRIGHT. UH YOUR A SCHOOL BUS DRIVER AND FOR WHAT SCHOOL CORPORATION DO YOU DRIVE FOR?

[redacted]: [redacted] SCHOOLS

[redacted]: OKAY, AND HOW LONG HAVE YOU DONE THAT?

[redacted]: ELEVEN YEARS

[redacted]: UH, DO YOU HAVE A ROUTE THAT YOU DO TWICE A DAY?

[redacted]: YES

[redacted]: AND IS IT THE SAME ROUTE?

[redacted]: YES

Fatal Traffic Accident

[redacted] 1992

[redacted] Rd [redacted]

Witnesses

[redacted]

DOB/ [redacted] 46

I was traveling north on [redacted] when I saw a school bus blinking yellow, then red and the stop sign came out I slowed to a stop and saw a little girl get off the bus. After she was off the bus she dropped a small piece of paper. The wind took the paper in front of the bus and she went after it. At this time the bus started forward. I honked my horn but it did no good. The right front wheel ran over the child and the bus came to a stop after the back wheel ran over the child.

[redacted]

73

The girl lost her paper. The wind blew it in front of the bus. She started after the paper and was hit by the front of the bus knocking her down under the wheels. She was run over by the front and back.

[redacted]

49

I was behind the bus and it stopped. The little girl got off. I seen a paper and then I looked for the little girl and I didn't see her and then I seen her under the bus trying to get the paper. I saw the back wheel run over her body.

[redacted]

Age 5

[redacted] is a sister of the victim, [redacted] She was watching [redacted] get off the the bus from a front window of her grandparents home and observed the accident. No statement was taken from [redacted]

[redacted]: WITH THE MIRRORS

[redacted]: OKAY. OH WHEN YOU DROP CHILDREN OFF. TELL ME AGAIN THAT. HOW THAT WORKS?

[redacted]: I HAVE A LOT OF DROP OFFS ON THE STATE HIGHWAY

[redacted]: UH-HUH

[redacted]: MY RULE IS I TURN MY YELLOW WARNING LIGHTS ON A LEAST TWO HOUSES PRIOR TO THE DROP OFF

[redacted]: ALRIGHT

[redacted]: AND WHEN YOU DISENGAGE THE DOOR SLIGHTLY THE RED LIGHT WILL COME ON. THAT IS DONE BEFORE I GET TO THE ACTUAL STOP TO WARN, TO LET EVERYONE KNOW THAT IS THE PLACE THAT WE'LL BE STOPPED AT.

[redacted]: ALRIGHT

[redacted]: THE KIDS MUST GET OFF IF THEY DO NOT HAVE TO CROSS THE ROAD THEY HAVE TO GET AT LEAST SIX FEET PAST. THERE IS A BERM ALONG SIDE OF THE ROAD FOR THE MAIL CARRIER. THAT IS APPROXIMATELY FOUR FEET WIDE SOME IS FIVE FEET AND THEY HAVE TO BE ACROSS THAT AND IN TO THEIR DRIVEWAYS BEFORE I SHUT THE DOOR AND THE RED LIGHTS GO OFF.

[redacted]: HOW IS THAT YOUR PROCEDURE OR IS THAT SOMETHING THAT IS STATE LAW?

[redacted]: THAT'S MINE

[redacted]: THAT'S YOURS. THAT'S SOMETHING THAT YOU PRACTICE EVERY DAY?

[redacted]: YES. IF THEY HAVE TO CROSS THE ROAD IN FRONT OF THE BUS, I KEEP THEM ON THE BUS UNTIL I KNOW THE TRAFFIC, ON COMING TRAFFIC IS STOPPED OR AT A GOOD DISTANCE, WHERE THEY CAN HAVE PLENTY OF TIME. THEN I MAKE SURE I WARN THE KIDS, MAKE SURE THAT IF THERE NOT, THE TRAFFIC IS COMING THERE WATCHING THAT TRAFFIC BEFORE THEY GET ON ACROSS. AND THEY HAVE TO GET OFF THE BERM ON THE OTHER SIDE AND IN TO THEIR DRIVE BEFORE I PROCEED.

[redacted]: OKAY. NOW ON THIS PARTICULAR AFTERNOON, THE ACCIDENT SCENE WHAT PART OF YOUR ROUTE IS THAT? WAS IT THE FIRST PART OF YOUR ROUTE, THE LAST PART OF YOUR ROUTE?

DATE '92

[redacted]: AND CAN YOU TELL ME WHAT TIME NORMALLY OF AN AFTERNOON THAT YOUR ROUTE STARTS. WHAT TIME NORMALLY DO YOU LEAVE YOUR HOUSE?

[redacted]: I LEAVE AT [redacted] I LEAVE HERE AT [redacted]. I LEAVE THE SCHOOL AT [redacted] AFTER [redacted]

[redacted]: OKAY. AND WHAT SCHOOL ARE YOU TALKING ABOUT?

[redacted]: [redacted] ELEMENTARY

[redacted]: AND WHER IS THAT LOCATED?

[redacted]: IN [redacted]

[redacted]: OH

[redacted]: OFF US [redacted]

[redacted]: OKAY. ABOUT HOW MANY CHILDREN DO YOU HAVE ON YOUR BUS IN THE AFTERNOON?

[redacted]: USUALLY AROUND 50 TO 5[redacted]

[redacted]: OKAY. AND YOUR PROCEDURE ON PICKING UP CHILDREN AND DROPPING CHILDREN OFF IS, DO YOU DO THE SAME THING EVERY TIME?

[redacted]: YES

[redacted]: OKAY. WHEN YOU PICK CHILDREN UP FROM THE SCHOOL, JUST BRIEFLY TELL ME ABOUT THAT.

[redacted]: WHEN I, WHEN THEY COME TO SCHOOL I AM JUST PARKED AND UH I'M THERE 10 MINUTES EARLY. THE ELEMENTARY COME OUT FIRST AND THE JUNIOR HIGH IS TRANSFERED FROM [redacted] OVER. THEY GET ON A BUS ABOUT QUARTER AFTER. THEN HIGH SCHOOL IS THERE WITHIN ABOUT TWO MINUTES LATER AND BOARD. WHEN HIGH SCHOOL GETS ON THEN I START THE BUS AND MAKE SURE EVERYONE IS SEATED AND

[redacted]: DO YOU DO THAT WITH A [redacted] MAKE SURE EVERYONE IS SEATED?

[redacted]: YES

[redacted]: OR JUST DO THAT WITH YOUR MIRRORS OR DO YOU WALK UP AND DOWN?

HERE?

[redacted]: I SAY SHE WAS A GOOD 8 TO 10 FEET AWAY FROM THE SIDE OF THE ROAD, INCLUDING THE BERM.

[redacted]: OKAY. NOW WERE PAST THE BERM?

[redacted]: NO THAT WOULD BE INCLUDING THE BERM. SHE WAS PROBABLY ANOTHER I'D SAY TWO, THREE, FOUR FEET ON IN TO THE DRIVE WAY.

[redacted]: OKAY. NOW NOT ONLY [redacted] IN THIS PARTICULAR STOP BUT WHEN A CHILD LEAVES YOUR BUS AND YOU VISUALLY WATCH THAT CHILD GO IN TO THE DRIVE WAY, IN TO THEIR FRONT YARD AND THERE PAST WHAT, OKAY, I'M TERMING THIS A SAFETY ZONE AS FAR AS YOUR CONCERNED, BEING FROM THE ROADWAY. ONCE YOU WATCH THAT CHILD GET IN TO WHAT YOU WOULD CALL YOUR SAFETY ZONE, WHAT DO YOU DO THEN?

[redacted]: AT THAT STOP I HAVE ANOTHER STOP IN TWO HOUSES. I USUALLY CHECK BACK TO SEE, CHECK THE CHILDREN AND THEN CHECK THE LEFT MIRRORS FOR THE TRAFFIC. ON THE HIGHWAY YOU HAVE A LOT OF PEOPLE WANTING TO GET AROUND YOU, UH AND THERES A LOT OF STOPS YOU HAVE TO BE CONCERNED ABOUT THE TRAFFIC AND WHETHER THERE GOING TO GET AROUND YOU SAFELY BEFORE YOU HAVE TO GET TO THAT NEXT STOP.

[redacted]: OKAY, UH YOU SAID YOU CHECKED THE CHILDREN. YOU DID THAT WITH YOUR MIRRORS?

[redacted]: YES

[redacted]: YOU HAVE A LARGE L PROBE AND 'E YOUR SEAT?

[redacted]: YES. YES IT SHOWS AT THE

[redacted]: YOU CHECK EVERY BODY AT THE TIME?

[redacted]: YES

[redacted]: SO THATS THE SAME MIRROR YOUR TALKING ABOUT?

[redacted]: YES

[redacted]: ALRIGHT. ON THIS [illegible] STOP. WHEN YOU STOPPED THE BUS DO YOU TAKE YOUR BUS OUT OF GEAR?

[redacted]: YES

[redacted]: IN THE FIRST PART OF THE ROUTE

[redacted]: OKAY. SO, SO THE CHILD THAT WAS KILLED WAS IN THE FIRST PART DROP OFFS?

[redacted]: RIGHT CLOSE TO THAT, YES

[redacted]: OKAY. WHEN THIS PARTICULAR CHILD WAS DROPPED OFF WAS THERE ANYTHING DIFFERENT THAT OCCURRED, AS FAR AS THE ACTUAL CHILD LEAVING THE BUS?

[redacted] NO

[redacted]: WAS THERE ANY EXTRA AMOUNT OF TRAFFIC IN THAT PARTICULAR TIME OF DAY?

[redacted]: NO

[redacted]: EVERYTHING, IN YOUR OPINION APPEARED TO BE NORMAL?

[redacted]: YES

[redacted]: ALRIGHT. WHAT I WANT YOU TO DO, IS BEST YOU CAN REMEMBER AND I KNOW YOU'VE HAD A COUPLE OF DAYS TO THINK ABOUT IT. AND YOU KNOW IT IS AN UPSETTING SITUATION BUT WHAT I WANT YOU TO DO IS TO TELL ME ABOUT THAT PARTICULAR DROP OFF. AND WHAT OCCURRED.

[redacted] I PULLED UP TO THE STOP, [redacted] CAME UP SPOKE TO ME, SHE GOT OFF THE BUS, GOT IN TO HER DRIVE WAY.

[redacted]: OKAY. I'M GOING STOP YOU THERE. SO SHE GOT OFF THE BUS AND YOU WATCHED HER LEAVE THE BUS?

[redacted]: YES

[redacted] YOU WATCHED HER GO PAST THIS SIX FOOT BERM THAT YOU MENTIONED BEFOREHAND?

[redacted] YES

[redacted] AND THEN YOU WATCHED HER GO IN TO HER DRIVE WAY?

[redacted] YES. SHE WAS

[redacted] HOW FAR, ABOUT HOW MANY FEET IN TO THE DRIVE WAY DO YOU SEE

[redacted]: WITH IN TWO HOUSES

[redacted]: WITH IN TWO HOUSES? DO YOU LEAVE THE FLASHERS ON OR TELL ME ABOUT THAT?

[redacted]: NO THEY GO OFF WHEN THE DOOR GOES SHUT AND THEN I TURN THE YELLOWS BACK ON TO LET THE WARNING YELLOWS TO LET THEM KNOW A STOP IS COMING VERY SOON AND THEN AS SOON AS I GET TO ABOUT ONE HOUSE AWAY THE RED GOES ON.

[redacted]: OKAY. LETS BACK UP YOU LET [redacted] OFF YOU WATCHED HER GO IN TO HER DRIVE WAY

[redacted] YES

[redacted]: HAD YOUR DOOR OPEN WHEN YOU WERE WATCHING HER GO IN TO THE DRIVE WAY

[redacted] YES

[redacted]: IS IT AUTOMATIC WHEN YOUR DOOR CLOSES YOUR STOP FLASHING SIGN COMES BACK IN?

[redacted] YES

[redacted] OR IS THAT SOMETHING YOU HAVE TO DO MANUALLY?

[redacted] YES. YES THATS AUTOMATIC WITH THE DOOR.

[redacted]: SO YOU SHUT THE DOOR?

[redacted] YES

[redacted]: YOUR SIGN ON THE LEFT SIDE OF YOUR BUS. THE STOP SIGN WITH THE FLASHING RED LIGHT COMES IN AUTOMATICALLY?

[redacted] YES

[redacted]: AND CHECKING THE TRAFFIC?

[redacted] YES

[redacted] CHECK THE CHILDREN STILL ON THE BUS?

[redacted]: SO YOU LEAVE IT IN NEUTRAL?

[redacted]: WELL, YES

[redacted]: DO YOU OR?

[redacted]: YES

[redacted]: DO YOU, YOU HESITATED SO IS THAT A PRACTICE OF YOURS?

[redacted]: YES. USUALLY AND THEN I THEN I'M PUTTING IT IN A GEAR WHILE THEY ARE WALKING AWAY FROM THE BUS. BUT IT GOES OUT OF GEAR AND THEN IT GOES. MY FOOT REMAINS ON THE CLUTCH AND THE BRAKE THE WHOLE TIME.

[redacted]: BUT YOU TAKE IT FROM WHAT EVER GEAR YOUR IN AND PUT IT IN NEUTRAL? IT'S A MANUAL TRANSMISSION, CORRECT?

[redacted]: YES. MY HAND IS ON THE GEAR SHIFT AND USUALLY I AM SHIFTING. I WAIT TILL THEY GET OFF THE BUS AND THEN I SHIFT IT DOWN TO FIRST.

[redacted]: OKAY

[redacted]: WHILE THEY ARE WALKING AWAY

[redacted]: THIS PARTICULAR TIME THOUGH YOUR VISIONS DEVERTED BACK TO TRAFFIC IN THE ROAD WAY?

[redacted]: AFTER, NO NOT UNTIL SHE IS OUT OF THE WAY, AFTER SHE'S PAST WHERE SHE IS SUPPOSE TO BE. THEN I CHECK THE CHILDREN AND THEN I CHECK FOR TRAFFIC AND PROCEED.

[redacted]: WHILE YOUR CHECKING THE TRAFFIC AND THE CHILDREN ON THE BUS THEN YOU ARE PUTTING IT IN TO GEAR?

[redacted]: YES

[redacted]: ALRIGHT, AND THAT WAS THE NORMAL PROCEDURE YOU USED ON THE DAY OF THE INCIDENT?

[redacted]: YES

[redacted]: ALRIGHT, YOU SAID THAT YOU HAD A STOP JUST AFTER YOU LEFT [redacted] OFF. IS THAT THE [illegible] HOUSE?

[redacted] YES

[redacted]: AND YOU PUT IT IN TO FIRST GEAR?

[redacted]: WHILE I'M DOING ALL THAT

[redacted]: RIGHT, THATS ALL

[redacted] KINDA DOING THAT ALL TOGETHER

[redacted]: KINDA DOING THAT ALL TOGETHER, ALRIGHT. WHILE YOU WERE DOING THIS DID YOU HEAR OR OBSERVE ANYTHING ELSE, DURING THIS TIME?

[redacted] NOT AT THAT SECOND, NO

[redacted] ALRIGHT, SO LETS GO IN TO THE NEXT FEW SECONDS WHAT HAPPENED THEN?

[redacted]: WHILE I WAS LOOKING IN MY SIDE MIRROR AT THE TRAFFIC AND PUT IT IN GEAR AND STARTED TO ROLL, I FELT THE BUMP.

[redacted] OKAY

[redacted]: AND I IMMEDIATELY HIT THE BRAKE, I KNEW WHAT HAD HAPPENED IN MY MIND AND I TOOK IT OUT OF GEAR AND TOOK THE SEAT BELT OFF, WENT TO THE BACK TO MAKE SURE AND CAME BACK AND CALLED FOR ASISTANCE OVER OUR [illegible]

[redacted]: OKAY, BECAUSE DID YOU HEAR ALL OF THE OTHER TRAFFIC HONKING THEN RIGHT?

[redacted]: NO UNTIL I GOT TO, AFTER I FELT THE BUMP, UH AND THE I GUESS AFTER I FELT THE BUMP AND I KNEW THEN AND GOT [redacted].

[redacted] OKAY, DID YOU, WHEN I WAS ON YOUR BUS, I WAS AT THE ACCIDENT SCENE THE NIGHT, THE AFTERNOON THAT IT HAPPENED UH, I NOTICED THAT YOU HAD A NICE RADIO SYSTEM SET UP THERE NOW IS THAT FOR YOUR TWO WAY RADIO OR IS THAT FOR AN AM FM RADIO?

[redacted] THE ONE IN THE FRONT?

[redacted] YEAH, THERE WAS A CONTROL PANEL ON THE LEFT SIDE OF WHERE YOUR DRIVERS SEAT IS?

[redacted] I HAVE AN AM FM RADIO

[redacted]: WAS IT ON ?

[redacted]: YES

[redacted]: OKAY. WHERE ARE THE SPEAKERS LOCATED ON YOUR BUS?

[redacted]: UH, THERES ONE IN THE THIRD SEAT AND ONE IN THE BACK. I'D SAY ABOUT THIRD FROM THE BACK.

[redacted]: OKAY. DO YOU KEEP THE VOLUME EXCESSIVELY LOUD?

[redacted]: NO

[redacted]: OKAY. UH WAS THE RADIO ON WHEN THE ACCIDENT OCCURRED?

[redacted]: YES

[redacted]: DO YOU LISTEN TO ANY PARTICULAR STATION, DO YOU LISTEN TO TAPES?

[redacted]: IT WAS ON WFMS

[redacted]: OKAY. DID YOU DO ANY THING DIFFERENT ON THIS PARTICULAR DAY AS FAR AS YOUR ROUTE, THAT YOU DIDN'T DO ON ANY OTHER DAY?

[redacted]: NO

[redacted]: IS THERE ANY THING ELSE YOU'D LIKE TO ADD TO THIS TAPED INTERVIEW THAT I HAVEN'T ASKED YOU?

[redacted]: PROBABLY, I CAN'T THINK OF ANY THING.

[redacted]: OKAY, THIS IS THE END OF THE INTERVIEW, IT'S A.M. 1992

1992. IT'S IN THE MORNING. WE'RE AT SHERIFFS DEPARTMENT. THIS IS DETECTIVE . ALSO PRESENT IS

: MR. WOULD YOU GIVE ME YOUR FULL NAME PLEASE?

: AND YOUR DATE OF BIRTH?

: 46

: AND YOUR ADDRESS?

: AND YOUR PHONE NUMBER PLEASE?

: OKAY. MR. WE'RE TALKING ABOUT AN ACCIDENT THAT OCCURRED ON ,1992 IN THE AFTERNOON ON SR SOUTH OF IS THAT CORRECT?

: YES SIR

: OKAY. AND YOU WERE A WITNESS AT THAT ACCIDNET SCENE. IS THAT CORRECT?

: YES SIR

: ALRIGHT, UH WE'VE ALREADY TALKED ABOUT SOME QUESTIONS THAT WE WENT OVER. WHAT I WANT TO DO IS ASK YOU JUST PRIOR TO THE ACCIDENT CAN YOU TELL ME WHICH DIRECTION YOU WERE GOING ON

: I WAS HEADING NORTH

: ALRIGHT, AND AS YOU WERE HEADED NORTH. DID YOU SEE UH SOUTH BOUND SCHOOL BUS APPROACHING?

: YES SIR

: AS THE SCHOOL BUS WAS APPROACHING. WOULD YOU TELL ME WHAT YOU SAW?

[redacted]: FIRST THING I SAW, I BELIEVE IT LET OFF ANOTHER STUDENT AND UH THERE WAS A ROW OF HOUSES THERE SO, I WAS ASSUMING IT MIGHT BE STOPPING AGAIN AND IT DID THE YELLOW LIGHTS STARTED BLINKING SO I WAS AWARE THAT THE BUS WAS GOING TO STOP AGAIN. SO I STARTED TO SLOW UH THEN THE RED LIGHT CAME ON AND THE STOP SIGN CAME OUT, SO I FURTHER SLOWED DOWN. UH

[redacted]: HOW FAR WERE YOU FROM THE APPROACHING SCHOOL BUS WHEN YOU CAME TO A COMPLETE STOP? PAUSE HAD YOU COME TO A COMPLETE STOP BEFORE THE ACCIDENT OCCURRED?

[redacted]: I'M NOT ABSOLUTELY CERTAIN, VERY CLOSE TO A COMPLETE STOP. I MAY HAVE BEEN JUST SLIGHTLY ROLLING. UH, I WOULD SAY THAT OH, A HUNDRED OR TWO HUNDRED FEET. I'M NOT CERTAIN.

[redacted]: OKAY

[redacted]: I WAS FAIRLY CLOSE

[redacted]: OKAY. YOU SAW IN A DISTANCE AS YOU WERE GOING NORTH BOUND THE BUS STOPPED AND YOU ASSUMED IT LET A CHILD OFF, AND THAT THE YELLOW LIGHT STARTED ON AS THE BUS STARTED?

[redacted]: I THINK EVERYTHING WENT BACK OFF AGAIN

[redacted]: WENT BACK OFF AGAIN?

[redacted]: AND THEN IT CAME BACK ON

[redacted]: THE YELLOW DID. THE FLASHING YELLOW CAME ON AGAIN?

[redacted]: I DEFINETLY REMEMBER THE FLASHING LIGHT COMING ON AND THEN THE RED LIGHT COMING ON AND SIGN COMING OUT BEFORE THE LITTLE GIRL GOT OFF THE BUS.

[redacted]: OKAY. DID YOU SEE A CHILD GET OFF THE BUS?

[redacted]: YES SIR

[redacted]: ALRIGHT. AT THAT TIME WERE YOU STILL ROLLING SLIGHTLY?

[redacted]: I'M NOT CERTAIN

[redacted]: OKAY. BUT YOU DID SEE A CHILD GET OFF THE BUS?

[redacted]: YES SIR

[redacted]: COULD YOU TELL IF IT WAS A BOY OR A GIRL AT THAT TIME?

[redacted]: NO, I FELT THAT IT WAS A LITTLE GIRL

[redacted]: ALRIGHT, AS THE LITTLE GIRL GOT OFF THE BUS, WHAT DID SHE DO?

[redacted]: SHE PROCEEDED IN TO HER DRIVE WAY A SHORT WAYS

[redacted]: CAN YOU TELL ME IN YOUR OPINION ABOUT HOW FAR IN TO HER DRIVE WAY?

[redacted]: I WOULD SAY IT WAS FIVE OR SIX FEET

[redacted]: IN TO THE DRIVE WAY?

[redacted]: IN TO THE DRIVE WAY

[redacted]: SHE WAS OFF THE PAVEMENT?

[redacted] YES, AS THE BEST THAT I . TO THE BEST TO MY RECOLLECTION SHE I WOULD SAY THAT SHE WAS OFF THE ROAD WAY IN HER DRIVE WAY

[redacted]: OKAY, THE LITTLE GIRL WAS WALKING IN TO HER DRIVE WAY TOWARDS THE HOUSE, WHAT HAPPENED THEN?

[redacted]: A SMALL SLIP OF PAPER FELL FROM HER HANDS ON TO HER DRIVE WAY AND SHE BENT DOWN TO PICK IT UP BEFORE SHE REACHED IT A GUST OF WIND TOOK THE PAPER OUT IN FRONT OF THE SCHOOL BUS.

[redacted] DID SHE CHASE THE PAPER?

[redacted]: YES SIR

[redacted]: DO YOU RECALL WHEN SHE WAS CHASING THE PAPER WAS SHE ALWAYS STANDING UP OR AT SOME POINT WAS SHE BENDING OVER TO TRY TO GRAB IT?

[redacted]: SHE BENT OVER TO PICK IT THE PAPER IN HER DRIVE WAY AND I THINK SHE CAME BACK UP I'M NOT SURE IF IT WAS ALL THE WAY, SHE WAS VERY, VERY SMALL, SO I MEAN ALL THE WAY WAS STILL VERY CLOSE TO THE GROUND. IF SHE CAME UP AND WAS IN RUNNING TOWARDS THE PAPER. IT ALL HAPPENED VERY QUICKLY.

[redacted] WAS THE PAPER BLOWN BACK TOWARDS THE BUS?

[redacted]: THE PAPER WAS BEING BLOWN JUST DIRECTLY IN FRONT OF THE BUS. I WOULD SAY THAT THE PAPER THAT SHE WOULD BE KINDA OF I THINK IN WITH THE DOOR. I MEAN SHE WENT STRAIGHT OUT THE DOOR AND THEN THE PAPER BLEW AT AN ANGLE JUST IN FRONT OF THE RIGHT FRONT WHEEL, JUST DIRECTLY UNDER THE BUMPER UH AND WAS JUST DIRECTLY IN FRONT OF THE SCHOOL BUS. SHE WAS JUST SHORT. THIS HAPPENED VERY QUICKLY AND SHE WAS JUST BEHIND THE PAPER. SHE HAD SEEN IT JUST MISSED IT WITH HER HAND AND WAS FOLLOWING IT RIGHT OUT IN FRONT OF THE BUS.

[redacted]: OKAY. I'M GONNA BACK UP A MINUTE. DO YOU REMEMBER WHICH DIRECTION YOU WERE GOING?

[redacted] TOWARDS [redacted]. TO THE NORTH.

[redacted] OKAY. DO YOU REMEMBER WHICH DIRECTION THE BUS WAS GOING?

[redacted] SOUTH

[redacted]: OKAY. AS THE LITTLE GIRL WAS CHASING THE PAPER, DID THE BUS START TO MOVE?

[redacted] NO, NOT IMMEDIATELY

[redacted] OKAY. TELL ME WHAT YOU SAW?

[redacted]: UH, SHE FOLLOWED THE PAPER OUT UH AND THE PAPER I THINK IT MUST OF STOPPED RIGHT JUST ALMOST TO THE BUS'S LEFT FRONT WHEEL IN ANY EVENT SHE BENT DOWN AGAIN TO TRY TO MAKE ANOTHER GRAB FOR IT AND THEN AT THAT POINT THE BUS STARTED TO PULL AND I WOULD SAY AT THAT POINT SHE WAS PRETTY WELL IN THE MIDDLE OF THE BUS UH, IN BETWEEN THE WHEELS MAYBE CLOSER TO THE LEFT FRONT WHEEL A LITTLE BIT AND THEN SHE I THINK AT THAT POINT SHE REALIZED THE BUS WAS MOVING AND SHE WHIRLED AROUND AND FACED AND SHE WAS RIGHT OVER AT THIS POINT I DON'T THINK SHE EVER GOT FULLY UP BECAUSE THE BUMPER WAS PUSHING HER.

[redacted]: OKAY.

[redacted] AND SHE TURNED AROUND AND WAS FACING THE SIDE OF THE ROAD TO HER HOUSE WHERE SHE HAD GOT OFF AND SHE JUMPED AT THAT POINT SHE JUST STARTED TRYING TO GET OUT OF THE WAY OF THE BUS AND SHE ENDED UP RIGHT UNDER THE RIGHT FRONT WHEEL.

[redacted]: AND YOU SAW THAT ACTION?

DATE [redacted] 98 BEST AVAILABLE

[redacted]: YES

[redacted]: OKAY, THE BUS KEPT ON MOVING?

[redacted]: THE BUS KEPT ON MOVING

[redacted]: OKAY, THE BUS KEPT ON MOVING WHEN DID THE BUS FINALLY STOP?

[redacted]: UH, RIGHT REAR WHEEL ALSO RAN OVER THE CHILD AND THE BUS CAME TO A STOP MAYBE TWENTY FEET AFTER THE RIGHT REAR WHEEL WENT OVER HER ALSO.

[redacted]: OKAY. WHEN THE BUS WAS MOVING BEFORE THE CHILD ACTUALLY GOT RUN OVER WHAT WERE YOU DOING?

[redacted]: I WAS WATCHING IT AND I WAS SCREAMING AND I WAS HONKING MY HORN.

[redacted]: AT THAT PARTICULAR TIME DID YOU HEAR ANY OTHER HORNS HONKING?

[redacted]: NO

[redacted]: OKAY. WHEN THE BUS CAME TO A STOP AFTER RUNNING OVER THE CHILD, WHAT DID YOU DO THEN?

[redacted]: I UH PULLED FORWARD TO THE RIGHT TO GET OFF THE ROAD FOR EMERGENCY VEHICLES WHICH I KNEW WOULD BE THERE AND STOPPED MY CAR AND STARED AT THE CHILD AND SHE DIDN'T MOVE AND THEN A LOT OF PEOPLE WERE RUNNING UP AT THAT POINT AND ONE LADY COVERED HER WITH A COAT AND THEN I JUST STARED AT HER AND SHE DIDN'T MOVE OR ANYTHING AND I JUST STAYED IN MY SEAT FOR SOME TIME I DON'T KNOW HOW LONG IT WAS.

[redacted]: DID YOU HAVE ANY CONVERSATION WITH THE DRIVER OF THE BUS OR ANYBODY ELSE?

[redacted]: NO SIR. I HEARD UH RADIO COMMUNICATION BETWEEN THE WOMAN AND THE SCHOOL CORPORATION, I THINK AND THEY WERE ASKING DID THE BUS HIT THE CHILD. AND THERE WAS SOME CONVERSATION THERE AND I WAS LISTENING TO SOME DEGREE BUT I COULDN'T TELL YOU WHO WAS DRIVING THE BUS AND I NEVER LOOKED.

[redacted]: OH

[redacted]: UH THE UH I GOT OUT OF THE CAR AND THERE WAS A ELDERLY MAN AND HIS WIFE BEHIND ME THAT SAW THE ACCIDENT AND WE DISCUSSED IT A

LITTLE BIT AND THEN UH

[redacted]: WHAT DID YOU TALK ABOUT?

[redacted]: UM, I MENTIONED TO HIM A PIECE OF PAPER THAT HAD DROPPED AND I'M NOT SURE IF HE SAW THAT OR NOT UH AND HIS WIFE WAS A UPSET AND UH WE TALKED ABOUT YOU KNOW JUST KINDA OF WENT OVER IT A LITTLE BIT.

[redacted]: YOU SAID YOU DIDN'T REALLY LOOK AT THE BUS DRIVER. YOU DIDN'T REALLY KNOW WHO WAS DRIVING THE BUS. BUT YOU DID SEE THE BUS?

[redacted]: OH YES

[redacted]: DURING THE ENTIRE INCIDENT DID YOU SEE THE BUS OR ANY OF THE SIGNALS DO ANYTHING IN YOUR OPINION THAT SHOULD NOT HAVE BEEN DONE?

[redacted] NO SIR

[redacted]: OKAY. THERE WAS NO ERRATIC DRIVING, NO MISUSE OF SIGNALS. FROM YOUR EXPERIENCE IN DRIVING ON ROAD WAYS IN [redacted] AND WATCHING SCHOOL BUSES FOR A NUMBER OF YEARS THERE WAS NOTHING OUT OF THE ORDINARY IN THIS PARTICULAR STOP WHEN THE CHILD GOT OFF?

[redacted]: NO, SHE WAS DRIVING PROPER SPEED AND EVERYTHING WAS DONE AT IT LOOKED TO ME RIGHT AT THE RIGHT TIMES AND UH JUST DIDN'T SEE THE CHILD THAT WAS A COMBINATION OF LOOSE PAPER, THE CHILD HAD LOOSE PAPERS IN THE WIND WAS GOING JUST THE YOU KNOW THE PERFECT DIRECTION AND THE COAT.

[redacted]: WINDY DAY, THAT YOU REMEMBER?

[redacted] IT WAS WINDY, GUSTY

[redacted]: ANYTHING ELSE YOU CAN REMEMBER MR. [redacted]?

[redacted] NO, NO

[redacted]: THIS IS THE END OF THE INTERVIEW IT'S [redacted] 1992 IT'S [redacted] A.M.

VOLUNTARY STATEMENT

DATE: ________ 92 PLACE [redacted] BCN SR [redacted] TIME STARTED [redacted] M.

I, the undersigned, [redacted] , am 73 years of age, having been born on [redacted] , at [redacted] ,

I now live at [redacted]

I have been duly warned and advised by [redacted] , a person who has identified himself as POLICE , that I do not have to make any statement at all, nor answer any questions or do anything that might tend to go against me or incriminate me in any manner, and that any statement I make may be used against me on the trial or trials for the offense or offenses concerning which the following statement is herein made. I was also warned and advised of my right to the advice and presence of a lawyer of my own choice before or at any time during any questioning or statement I make, and if I am not able to hire a lawyer I may request and have a lawyer appointed for me, by the proper authority, without cost or charge to me.

I do not want to talk to a lawyer, and I hereby knowingly and purposely waive my right to the advice and presence of a lawyer before and during any questioning or at any time before or while I voluntarily make the following statement to the aforesaid person, knowing that anything I say can and will be used against me in a court or courts of law.

I declare that the following voluntary statement is made to the aforesaid person of my own free will without promise of hope or reward, without fear or threat of physical harm, without coercion, favor or offer of favor, without leniency or offer of leniency, by any person or persons whomsoever.

[redacted] The girl lost her paper the wind blew it in front of the bus. She started after the paper and was hit by the front of the bus knocking her down under the wheel. She was run over by the front and back. [redacted]

[redacted]

[redacted] [redacted]

[redacted]

I have read this statement consisting of ________ page(s). and I certify that the facts contained therein are true and correct. I further certify that I made no request for the advice or presence of a lawyer before or during any part of this statement, nor at any time before it was finished did I request that this statement be stopped. I also declare that I was not told or prompted what to say in this statement.

This statement was completed at [redacted] .M. on the [redacted] day of ________________, 1992

WITNESS [redacted]

[redacted]
Signature of person giving voluntary statement

WITNESS ________________

VOLUNTARY STATEMENT

DATE: 92 PLACE HIWAY [redacted] TIME STARTED [redacted] ABOUT P.M.

I, the undersigned, [redacted], am 46 years of age, having been born

on [redacted], at [redacted]

I now live at [redacted]

I have been duly warned and advised by POLICE OFFICER, a person who has identified himself as

_______________, that I do not have to make any statement at all, nor answer any questions or do anything that might tend to go against me or incriminate me in any manner, and that any statement I make may be used against me on the trial or trials for the offense or offenses concerning which the following statement is herein made. I was also warned and advised of my right to the advice and presence of a lawyer of my own choice before or at any time during any questioning or statement I make, and if I am not able to hire a lawyer I may request and have a lawyer appointed for me, by the proper authority, without cost or charge to me.

I do not want to talk to a lawyer, and I hereby knowingly and purposely waive my right to the advice and presence of a lawyer before and during any questioning or at any time before or while I voluntarily make the following statement to the aforesaid person, knowing that anything I say can and will be used against me in a court or courts of law.

I declare that the following voluntary statement is made to the aforesaid person of my own free will without promise of hope or reward, without fear or threat of physical harm, without coercion, favor or offer of favor, without leniency or offer of leniency, by any person or persons whomsoever.

I WAS TRAVELING NORTH ON [redacted] WHEN I SAW A SCHOOL BUS BLINKING YELLOW, THEN RED AND THE STOP SIGN CAME OUT I SLOWED TO A STOP AND SAW A LITTLE GIRL GET OFF THE BUS. AFTER SHE WAS OFF THE BUS SHE DROPED A SMALL PIECE OF PAER. THE WIND TOOK THE PAPER IN FRONT OF THE BUS AND SHE WENT AFTER IT. AT THIS TIME THE BUS STARTED FORWARD. I HONKED MY HORN BUT IT DID NO GOOD. THE RIGHT FRONT WHEEL RAN OVER THE CHILD AND THE BUS CAME TO A STOP AFTER THE BACK RIGHT WHEEL RAN OVER THE CHILD.

I have read this statement consisting of 1 page(s), and I certify that the facts contained therein are true and correct. I further certify that I made no request for the advice or presence of a lawyer before or during any part of this statement, nor at any time before it was finished did I request that this statement be stopped. I also declare that I was not told or prompted what to say in this statement.

This statement was completed at 10.15 [redacted] M. on the [redacted] day of _______________, 1992

WITNESS: [redacted]

WITNESS: [redacted]

[redacted]
Signature of person giving voluntary statement

VOLUNTARY STATEMENT
(NOT UNDER ARREST)

I, [redacted], am not under arrest for, nor am I being detained for any crimin

offenses concerning the events I am about to make known to SHERIFF'S DEPT
Without being accused of or questioned about any criminal offenses regarding the facts I am about to state, I volunteer the following info mation of my own free will, for whatever purposes it may serve.

I am 34 years of age, and I live at [redacted]

I WAS IN THE BACKYARD OF MY HOUSE WHEN I HEARD A CAR HORN START BEEPING CONTINUOUSLY. AS I WALKED AROUND FRONT I SAW A LITTLE GIRL @ 6-7 YRS old laying on the road @ 3 feet behind the South bound School bus [redacted].

I RACED TO THE CHILD, FELT HER RIGHT WRIST FOR A PULSE AND CHECKED FOR BREATHING. OTHERS NEAR GOING FOR THE PHONE.

THERE WAS NO PULSE AND NO INDICATION OF BREATHING AND THE CHILD'S HEAD APPEARED FLATTENED. I HELPED TRAFFIC CONTROL AND CONSOLING BUS DRIVER AND CHILDREN.

I have read each page of this statement consisting of 1 page(s), each page of which bears my signature, and corrections, any, bear my initials, and I certify that the facts contained herein are true and correct.

Dated at [redacted] this [redacted] day of [redacted] 19 [redacted]

WITNESS: [redacted]

WITNESS: [redacted]

[redacted]
Signature of person giving voluntary statement

BEST AVAILABLE

VOLUNTARY STATEMENT
(NOT UNDER ARREST)

PAGE NO. 1 OF 1 PAGES

I, [redacted], am not under arrest for, nor am I being detained for any criminal offenses concerning the events I am about to make known to [redacted]
Without being accused of or questioned about any criminal offenses regarding the facts I am about to state, I volunteer the following information of my own free will, for whatever purposes it may serve.

I am 49 years of age, and I live at [redacted]

I WAS behind the bus & it stopped the little girl got off, I seen a paper & then I looked for the little girl & I didn't see her & then I seen her under the BUS trying to get the paper, I SAW the BACK wheels run over her body. [redacted]

[redacted]

I have read each page of this statement consisting of 1 page(s), each page of which bears my signature, and corrections, if any, bear my initials, and I certify that the facts contained herein are true and correct.

Dated at [redacted] this [redacted] day of [redacted] 19 92

WITNESS: [redacted]

WITNESS: _____

[redacted]
Signature of person giving voluntary statement

Appendix B:

NASS Accident Form

U.S. Department of Transportation
National Highway Traffic Safety Administration

ACCIDENT FORM

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. Primary Sampling Unit Number: 1 0
2. Case Number - Stratum: 9 2 1 0

IDENTIFICATION

3. Number of General Vehicle Forms Submitted: 0 1
4. Date of Accident (Month,Day,Year): [redacted] 1 9 2
5. Time of Accident: [redacted]

Code reported military time of accident.

NOTE: Midnight = 2400
Unknown = 9999

SPECIAL STUDIES - INDICATORS

Check (✓) each special study (SS12-SS16 below) that has been completed; code 1 for the checked special studies and 0 for the special studies not checked.

6. ___SS12 Not Active: 0
7. ___SS13 Not Active: 0
8. ___SS14 Fatal AOPS: 0
9. ___SS15 _____: 0
10. ___SS16 _____: 0

NUMBER OF EVENTS

11. Number of Recorded Events in This Accident: 0 3

Code the number of events which occurred in this accident.

ACCIDENT EVENTS

For each event that occurred in the accident, code the lowest numbered vehicle in the left columns and the other involved vehicle or object on the right.

Accident Event Sequence Number	Vehicle Number	Class Of Vehicle	General Area of Damage	Vehicle Number or Object Contacted	Class Of Vehicle	General Area of Damage
12. 0 1	13. 0 1	14. 2 0	15. F	16. 7 2	17. 0 0	18. 0
19. 0 2	20. 0 1	21. 2 0	22. F	23. 7 2	24. 0 0	25. 0
26. 0 3	27. 0 1	28. 2 0	29. F	30. 7 2	31. 0 0	32. 0
33. 0 4	34. ___ ___	35. ___ ___	36. ___	37. ___ ___	38. ___ ___	39. ___
40. 0 5	41. ___ ___	42. ___ ___	43. ___	44. ___ ___	45. ___ ___	46. ___

IF GREATER THAN FIVE EVENTS, CONTINUE CODING ON THE ACCIDENT EVENT SUPPLEMENT

Appendix C:

NASS Vehicle Forms

U.S. Department of Transportation
National Highway Traffic Safety Administration

GENERAL VEHICLE FORM

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. Primary Sampling Unit Number: 10
2. Case Number - Stratum: 9210
3. Vehicle Number: 01

VEHICLE IDENTIFICATION

4. Vehicle Model Year: 87
   Code the last two digits of the model year
   (99) Unknown

5. Vehicle Make (specify): 23
   GMC
   Applicable codes are found in your NASS Data Collection, Coding and Editing Manual.
   (99) Unknown

6. Vehicle Model (specify): 901
   6000
   Applicable codes are found in your NASS Data Collection, Coding and Editing Manual.
   (999) Unknown

7. Body Type: 50
   Note: Applicable codes may be found on the back of this page.

8. Vehicle Identification Number
   1GDJ6P1B5HV_____
   Left justify; Slash zeros and letter Z (0 and Z)
   No VIN—Code all zeros
   Unknown—Code all nine's

OFFICIAL RECORDS

9. Police Reported Vehicle Disposition: 0
   (0) Not towed due to vehicle damage
   (1) Towed due to vehicle damage
   (9) Unknown

10. Police Reported Travel Speed: 99
    Code to the nearest mph (NOTE: 00 means less than 0.5 mph)
    (97) 96.5 mph and above
    (99) Unknown

11. Police Reported Alcohol Presence: 0
    (0) No alcohol present
    (1) Yes (alcohol present)
    (7) Not reported
    (8) No driver present
    (9) Unknown

    Note: See variables 37 through 55 (Page 4) for information on Other Drugs

12. Alcohol Test Result For Driver: 00
    Code actual value (decimal implied before first digit—0.xx)
    (95) Test refused
    (96) None given
    (97) AC test performed, results unknown
    (98) No driver present
    (99) Unknown

    Source: POLICE REPORT

ACCIDENT RELATED

13. Speed Limit: 55
    (00) No statutory limit
    Code posted or statutory speed limit
    (99) Unknown

14. Attempted Avoidance Maneuver: 01
    (00) No impact
    (01) No avoidance actions
    (02) Braking (no lockup)
    (03) Braking (lockup)
    (04) Braking (lockup unknown)
    (05) Releasing brakes
    (06) Steering left
    (07) Steering right
    (08) Braking and steering left
    (09) Braking and steering right
    (10) Accelerating
    (11) Accelerating and steering left
    (12) Accelerating and steering right
    (97) No driver present
    (98) Other action (specify): _____
    (99) Unknown

15. Accident Type: 13
    Applicable codes may be found on the back of page two of this field form
    (00) No impact
    Code the number of the diagram that best describes the accident circumstance
    (98) Other accident type (specify): _____
    (99) Unknown

**** SKIP TO VARIABLE GV37 IF GV07 DOES NOT EQUAL 01-49 ****

OCCUPANT RELATED

16. Driver Presence in Vehicle: 1
    (0) Driver not present
    (1) Driver present
    (9) Unknown

17. Number of Occupants This Vehicle: 99
    (00-96) Code actual number of occupants for this vehicle
    (97) 97 or more
    (99) Unknown
    Estimated 40-45

18. Number of Occupant Forms Submitted: 02

VEHICLE WEIGHT ITEMS

19. Vehicle Curb Weight: 99,900
    ____Code weight to nearest 100 pounds.
    (010) Less than 1050 pounds
    (135) 13,500 pounds or more
    (999) Unknown

    Source: _____

20. Vehicle Cargo Weight: 9,900
    ____Code weight to nearest 100 pounds.
    (00) Less than 50 pounds
    (97) 9,650 pounds or more
    (99) Unknown

RECONSTRUCTION DATA

21. Towed Trailing Unit: 0
    (0) No towed unit
    (1) Yes—towed trailing unit
    (9) Unknown

22. Documentation of Trajectory Data for This Vehicle: 0
    (0) No
    (1) Yes

23. Post Collision Condition of Tree or Pole (For Highest Delta V): 0
    (0) Not collision (for highest delta V) with tree or pole
    (1) Not damaged
    (2) Cracked/sheared
    (3) Tilted <45 degrees
    (4) Tilted ≥45 degrees
    (5) Uprooted tree
    (6) Separated pole from base
    (7) Pole replaced
    (8) Other (specify): _____
    (9) Unknown

24. Rollover: 0
    (0) No rollover (no overturning)

    Rollover (primarily about the longitudinal axis)
    (1) Rollover, 1 quarter turn only
    (2) Rollover, 2 quarter turns
    (3) Rollover, 3 quarter turns
    (4) Rollover, 4 or more quarter turns (specify): _____

    (5) Rollover--end-over-end (i.e., primarily about the lateral axis)
    (9) Rollover (overturn), details unknown

OVERRIDE/UNDERRIDE (THIS VEHICLE)

25. Front Override/Underride (this Vehicle): 0

26. Rear Override/Underride (this Vehicle): 0

    (0) No override/underride, or not an end-to-end impact

    Override (see specific CDC)
    (1) 1st CDC
    (2) 2nd CDC
    (3) Other not automated CDC (specify): _____

    Underride (see specific CDC)
    (4) 1st CDC
    (5) 2nd CDC
    (6) Other not automated CDC (specify): _____

    (7) Medium/heavy truck or bus override
    (9) Unknown

HEADING ANGLE AT IMPACT FOR HIGHEST DELTA V

Values: (000)-(359) Code actual value
(997) Noncollision
(998) Impact with object
(999) Unknown

27. Heading Angle For This Vehicle: 998

28. Heading Angle For Other Vehicle: 998

29. Basis for Total Delta V (highest) 4

Delta V Calculated
(1) CRASH program—damage only routine
(2) CRASH program—damage and trajectory routine
(3) Missing vehicle algorithm

Delta V Not Calculated
(4) At least one vehicle (which may be this vehicle) is beyond the scope of an acceptable reconstruction program, regardless of collision conditions.
(5) All vehicles within scope (CDC applicable) of CRASH program but one of the collision conditions is beyond the scope of the CRASH program or other acceptable reconstruction technique, regardless of adequacy of damage data.
(6) All vehicle and collision conditions are within scope of one of the acceptable reconstruction programs, but there is insufficient data available.

COMPUTER GENERATED DELTA V

	Secondary	Highest
30. Total Delta V		99

_____ Nearest mph _____

(NOTE: 00 means less than 0.5 mph)
(97) 96.5 mph and above
(99) Unknown

	Secondary	Highest
31. Longitudinal Component of Delta V		± 99

_____ Nearest mph _____

(NOTE: __00 means greater than −0.5 and less than +0.5 mph)
(±97) ±96.5 mph and above
(__99) Unknown

	Secondary	Highest
32. Lateral Component of Delta V		± 99

_____ Nearest mph _____

(NOTE: __00 means greater than −0.5 and less than +0.5 mph)
(±97) ±96.5 mph and above
(__99) Unknown

33. Energy Absorption 9999.900

_____ Nearest 100 foot-lbs _____

(NOTE: 0000 means less than 50 foot-lbs)
(9997) 999,650 foot-lbs or more
(9999) Unknown

34. Confidence In Reconstruction Program Results (For Highest Delta V) 0
(0) No reconstruction
(1) Collision fits model — results appear reasonable
(2) Collision fits model — results appear high
(3) Collision fits model — results appear low
(4) Borderline reconstruction — results appear reasonable

35. Type of Vehicle Inspection 1
(0) No inspection
(1) Complete inspection
(2) Partial inspection (specify):
_____

36. Is this an AOPS Vehicle? 0
(0) No
(1) Yes

IS OLDMISS APPLICABLE FOR THIS VEHICLE? [ ] YES [✓] NO

IF YES: IS A COMPLETED OLDMISS PROGRAM SUMMARY INCLUDED? [ ] YES [ ] NO

37. Police Reported Other Drug Presence ___0___
- (0) No other drugs present
- (1) Yes (other drug present)
- (7) Not reported
- (8) No driver present
- (9) Unknown

38. Police Reported Observation/Perception Test Type For Driver ___0___
- (0) No observation/perception test given
- (1) Drug recognition technician (DRT) determination using DEC process
- (2) Behavioral
- (3) Other physical observation/perception determination (specify): _____
- (4) DEC process available, unknown if determination made
- (5) DEC process not available, unknown if other observation/perception test given
- (7) Other observation/perception test (specify): _____
- (8) No driver present

39. Other Drug Specimen Test Type For Driver ___0___
- (0) No specimen test given
- (1) Blood test
- (2) Urine test
- (3) Other specimen tests (specify): _____
- (7) Unspecified specimen test
- (8) No driver present
- (9) Unknown if specimen test given

DRUG EVALUATION CLASSIFICATION
OTHER DRUGS TEST RESULTS FOR DRIVER

	DEC Observation/ Perception Test Results	Specimen Test Results
Narcotic Drug	40. 0	41. 0
Depressant Drug	42. 0	43. 0
Stimulant Drug	44. 0	45. 0
Hallucinogen Drug	46. 0	47. 0
Cannabinoid Drug	48. 0	49. 0
Phencyclidine (PCP)	50. 0	51. 0
Inhalant Drug	52. 0	53. 0
Other Drug (Excluding Nicotine, Aspirin, Alcohol, Drugs Administered Post-Crash)	54. 0	55. 0

Codes For Observation/Perception Test Results

- (0) No DEC observation/perception test given
- (1) Passed DEC observation/perception test
- (2) Failed DEC observation/perception test
- (3) DEC observation/perception test given—results unknown
- (8) No driver present
- (9) Unknown if DEC observation/perception test given

Codes for Specimen Test Results

- (0) No specimen test given
- (1) Drug not found in specimen
- (2) Drug found in specimen
- (7) Specimen test given, results unknown or not obtained
- (8) No driver present
- (9) Unknown if specimen test given

OTHER DATA

56. Driver's Zip Code ____

(00000) Driver not present
(00001) Driver not a resident of U.S. or territories
_____ Code actual 5-digit zip code
(99999) Unknown

57. Driver's Race/Ethnic Origin 1
(0) Driver not present
(1) White (non-Hispanic)
(2) Black (non-Hispanic)
(3) White (Hispanic)
(4) Black (Hispanic)
(5) American Indian, Eskimo or Aleut
(6) Asian or Pacific Islander
(8) Other (specify):
_____
(9) Unknown

58. Vehicle Special Use (This Trip) 2
(0) No special use
(1) Taxi
(2) Vehicle used as school bus
(3) Vehicle used as other bus
(4) Military
(5) Police
(6) Ambulance
(7) Hearse
(8) Fire truck or car
(9) Unknown

ROLLOVER DATA

If GV07 (Body Type) ≠ 1-49, leave GV59-GV63 blank.
If GV24 (Rollover) = 0, then GV59-GV63 must equal 0.
If GV24 = 9, then GV59-GV63 must equal 9.

59. Rollover Initiation Type 0
(0) No rollover
(1) Trip-over
(2) Flip-over
(3) Turn-over
(4) Climb-over
(5) Fall-over
(6) Bounce-over
(7) Collision with another vehicle
(8) Other rollover initiation type specify):
_____
(9) Unknown rollover initiation type

60. Location of Rollover Initiation 0
(0) No rollover
(1) On roadway
(2) On shoulder—paved
(3) On shoulder—unpaved
(4) On roadside or divided trafficway median
(9) Unknown

61. Rollover Initiation Object Contacted 0 0

62. Location on Vehicle Where Initial Principal Tripping Force Is Applied 0
(0) No rollover
(1) Wheels/tires
(2) Side plane
(3) End plane
(4) Undercarriage
(5) Other location on vehicle (specify):
_____
(8) Non-contact rollover forces (specify):
_____
(9) Unknown

63. Direction of Initial Roll 0
(0) No rollover
(1) Roll right - primarily about the longitudinal axis
(2) Roll left - primarily about the longitudinal axis
(5) End-over-end (i.e., primarily about the lateral axis)
(9) Unknown roll direction

PRECRASH DATA

64. Pre-Event Movement (Prior to Recognition of Critical Event) 0 3
(01) Going straight
(02) Slowing or stopping in traffic lane
(03) Starting in traffic lane
(04) Stopped in traffic lane
(05) Passing or overtaking another vehicle
(06) Disabled or parked in travel lane
(07) Leaving a parking position
(08) Entering a parking position
(09) Turning right
(10) Turning left
(11) Making a U-turn
(12) Backing up (other than for parking position)
(13) Negotiating a curve
(14) Changing lanes
(15) Merging
(16) Successful avoidance maneuver to a previous critical event
(97) Other (specify):
_____
(98) No driver present
(99) Unknown

PRECRASH DATA (Continued)

65. Critical Precrash Event 80

This Vehicle Loss of Control Due To:
(01) Blow out or flat tire
(02) Stalled engine
(03) Disabling vehicle failure (e.g., wheel fell off) (specify): _____
(04) Non-disabling vehicle problem (e.g., hood flew up) (specify): _____
(05) Poor road conditions (puddle, pot hole, ice, etc.) (specify): _____
(06) Traveling too fast for conditions
(08) Other cause of control loss (specify): _____
(09) Unknown cause of control loss

This Vehicle Traveling
(10) Over the lane line on left side of travel lane
(11) Over the lane line on right side of travel lane
(12) Off the edge of the road on the left side
(13) Off the edge of the road on the right side
(14) End departure
(15) Turning left at intersection
(16) Turning right at intersection
(17) Crossing over (passing through) intersection
(19) Unknown travel direction

Other Motor Vehicle In Lane
(50) Stopped
(51) Traveling in same direction with lower speed (i.e., lower steady speed or decelerating)
(52) Traveling in same direction with higher speed
(53) Traveling in opposite direction
(54) In crossover
(55) Backing
(59) Unknown travel direction of other motor vehicle in lane

Other Motor Vehicle Encroaching Into Lane
(60) From adjacent lane (same direction)—over left lane line
(61) From adjacent lane (same direction)—over right lane line
(62) From opposite direction—over left lane line
(63) From opposite direction—over right lane line
(64) From parking lane
(65) From crossing street, turning into same direction
(66) From crossing street, across path
(67) From crossing street, turning into opposite direction
(68) From crossing street, intended path not known
(70) From driveway, turning into same direction
(71) From driveway, across path
(72) From driveway, turning into opposite direction
(73) From driveway, intended path not known
(74) From entrance to limited access highway
(78) Encroachment by other vehicle—details unknown

Pedestrian or Pedalcyclist, or Other Nonmotorist
(80) Pedestrian in roadway
(81) Pedestrian approaching roadway
(82) Pedestrian - unknown location
(83) Pedalcyclist or other nonmotorist in roadway (specify): _____
(84) Pedalcyclist or other nonmotorist approaching roadway (specify): _____
(85) Pedalcyclist or other nonmotorist—unknown location (specify): _____

Object or Animal
(87) Animal in roadway
(88) Animal approaching roadway
(89) Animal—unknown location
(90) Object in roadway
(91) Object approaching roadway
(92) Object—unknown location

(98) Other critical precrash event (specify): _____
(99) Unknown

For Corrective Actions Attempted see variable GV14 (Attemped Avoidance Manuever)

66. Precrash Stability After Avoidance Maneuver 0
(0) No avoidance maneuver
(1) Tracking
(2) Skidding longitudinally—rotation less than 30 degrees
(3) Skidding laterally—clockwise rotation
(4) Skidding laterally—counterclockwise rotation
(7) Other vehicle loss-of-control (specify): _____
(8) No driver present
(9) Precrash stability unknown

67. Precrash Directional Consequences of Avoidance Maneuver (Corrective Action) 0
(0) No avoidance maneuver
(1) Vehicle stayed in travel lane where avoidance maneuver was initiated
(2) Vehicle stayed on roadway but left travel lane where avoidance maneuver was initiated
(3) Vehicle stayed on roadway, not known if left travel lane where avoidance maneuver was initiated
(4) Vehicle departed roadway
(5) Avoidance maneuver initiated off roadway
(8) No driver present
(9) Directional consequences unknown

*** IF THE CDS APPLICABLE VEHICLE WAS NOT INSPECTED (I.E., GV35=0), ***
DO NOT COMPLETE THE EXTERIOR AND INTERIOR VEHICLE FORMS.

*** IF GV07 DOES NOT EQUAL 01-49, DO NOT COMPLETE ***
THE EXTERIOR VEHICLE, INTERIOR VEHICLE,
OCCUPANT ASSESSMENT, AND OCCUPANT INJURY FORMS.

US Department of Transportation
National Highway Traffic Safety Administration

PSU/Case Number 10921C
Vehicle Number 01

NATIONAL ACCIDENT SAMPLING SYSTEM—CONTINUOUS SAMPLING SUBSYSTEM
VEHICLE

DAMAGE DESCRIPTION

Tire—Wheel Damage
Rotation physically restricted
RF_____ For rear wheels
LF_____ circle axle(s)
RR_____ 2 3
LR_____

(1) Yes, (2) No, (8) NA, (9) Unk.

TYPE OF TRANSMISSION

✓ Manual ___ Automatic

Front Track: 78"
Cab Width: N/A
Curb Weight: UNKNOWN
Overall Length: 420.5"
Wheel Base: 254.5"
Engine Size: cyl. V-8
displ. 366 CI

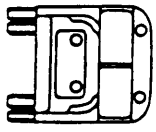
WHEEL STEER ANGLES

(For locked front wheels or displaced rear axles only)

RF ±___ ___°
LF ±___ ___°
RR ±___ ___°
LR ±___ ___°

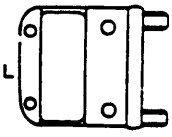
For rear wheels circle axle(s) 2 3

Within ± 5 degrees



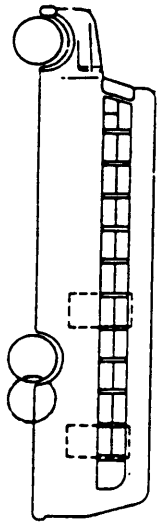
FRONT CONVENTIONAL

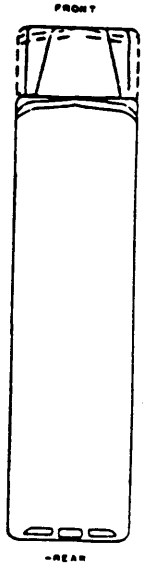
FRONT FORWARD CONTROL

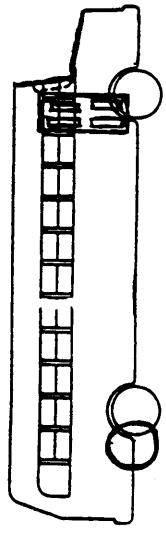


NO DAMAGE

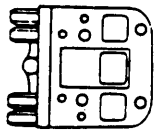
POST-CRASH





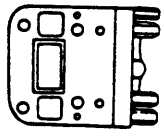


POST-CRASH



REAR CONVENTIONAL

REAR FORWARD CONTROL



Note: Sketch new perimeter and cross hatch direct damage and single hatch induced damage on all views. Annotate observations which might be useful in reconstructing the accident (e.g., grass in tire bead, direction of striations, scuff on sidewall, etc.)
If pulling trailer sketch type of trailer and damage received on the back of this page.
Annotate any damage caused by extrication such as component removal by torching, prying or hydraulic shears.
Annotate any tires which are deflated due to damage on the vehicle sketch.
If the vehicle contacted a pedestrian, complete page 6R

Appendix D:

NASS Interview Form

U.S. Department of Transportation
National Highway Traffic Safety Administration

INTERVIEW FORM

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. Primary Sampling Unit Number 1 0
2. Case Number - Stratum 9 2 1 0
3. Vehicle Number 0 1

Interviewee(s) Role or Name(s): POLICE TAPE INTERVIEW WITH DRIVER

Review the Interview Cue Sheet prior to conducting interview(s) to ensure the acquisition of all pertinent data.

GENERAL DESCRIPTION OF ACCIDENT SEQUENCE

SEE TRANSCRIPTED PAGES OF POLICE INTERVIEW

SPECIFIC QUESTIONS

Key to Researcher: Have you obtained the following through the interviewee(s) description and specific questions?

[ ] PRE-CRASH, AT IMPACT vehicle travel/driver intention
[ ] Direction of travel
[ ] Avoidance maneuvers
[ ] Impact description/orientation
[ ] Speed estimate (precrash/at impact)
[ ] Post-impact trajectory
[ ] Door status (precrash/postcrash)
[ ] Final rest position
[ ] Previous vehicle damage
[ ] Glazing type
[ ] Vehicle glazing status
[ ] PAR clarifications
[ ] Glove box status

Cargo? No [ ] Yes [ ] Interviewee's Estimated Cargo Weight _____

Description of Cargo _____

Present Location of Vehicle (if not yet inspected)?: _____

HS Form 433D (1/92)

Information collected in this report is used to complete HS Forms 433A and 433B. These reports are authorized by P.L. 89-563, Title 1, Section 106, 108, and 112. While you are not required to respond, your cooperation is needed to make the results of this data collection effort comprehensive, accurate, and timely.

OCCUPANT DATA

Enter the occupant's seat position in the first row and complete the column below it using the information from the interviewee(s).

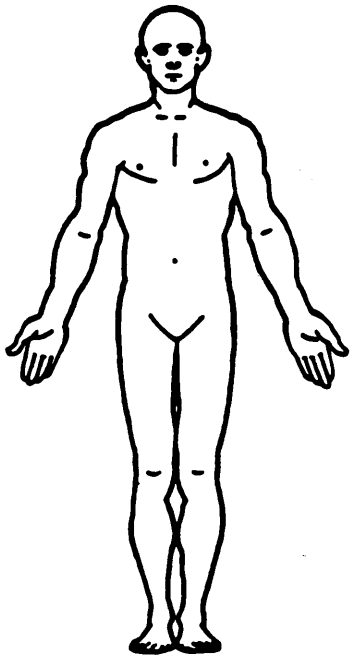
SEAT POSITION	DRIVER			
RACE ? HISPANIC? [√] No [ ] Yes	WHITE	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX
AGE/SEX	41-FEMALE			
HEIGHT (IN)	62 INCHES			
WEIGHT (LBS.)	125 POUNDS			
POSTURE	NORMAL			
EJECTED? [√] No [ ] Yes	NO			
DESCRIBE THE EJECTION PATH	N/A			
ENTRAPPED? [√] No [ ] Yes	NO			
DESCRIBE ENTRAPMENT	N/A			
DESCRIBE TYPE OF RESTRAINT	MANUAL 2-POINT LAP			
WERE BELTS WORN? [ ] No [√] Yes	YES			
HOW WHERE THE BELTS WORN?	NORMAL			
DESCRIBE ANY RESTRAINT FAILURES	NONE			
TYPE OF TREATMENT	NONE			
NAME OF TREATMENT FACILITY	N/A			
DAYS IN HOSPITAL?	N/A			
NO. OF LOST WORK DAYS?	UNKNOWN			
FOLLOW-UP TREATMENT	N/A			
WOULD YOU SIGN A MEDICAL RELEASE?	N/A			

PSU Number 1 0 Case Number—Stratum 9 2 1 0 Vehicle Number 0 1 Occupant Number 0 1

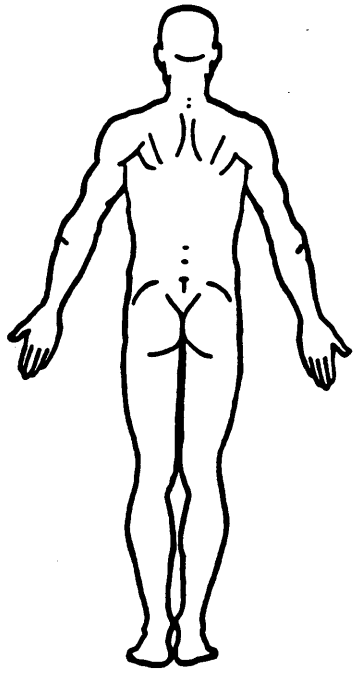
INJURY DATA FROM INTERVIEWEE(S)

Indicate the *Location, Lesion, Detail, and Source* of all injuries. Specify interviewee(s): Driver

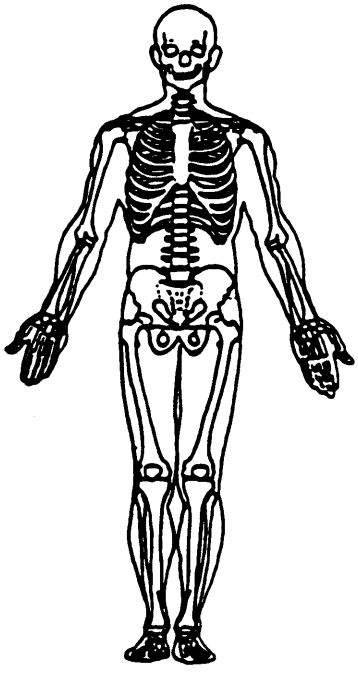
SOFT TISSUE/INTERNAL INJURIES

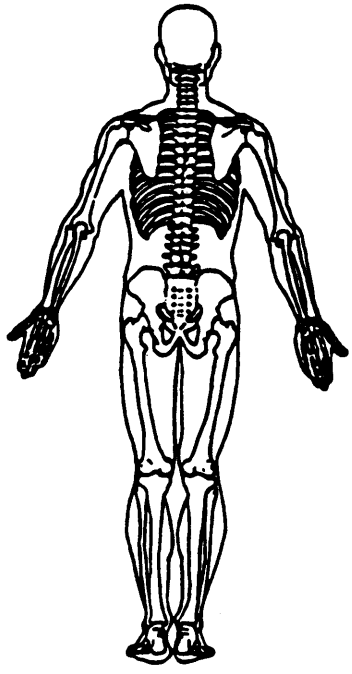


Not Injured



SKELETAL INJURIES





The space provided on the back of this page may be used to document injuries noted by the interviewee(s).

Appendix E:

NASS Occupant Form: School Bus Driver

U.S. Department of Transportation
National Highway Traffic Safety Administration

OCCUPANT ASSESSMENT FORM

Form Approved
O.M.B. No. 2127-0021

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. Primary Sampling Unit Number: 10
2. Case Number - Stratum: 9210
3. Vehicle Number: 01
4. Occupant Number: 01

OCCUPANT'S CHARACTERISTICS

5. Occupant's Age: 41
   Code actual age at time of accident.
   (00) Less than one year old (specify by month):
   (97) 97 years and older
   (99) Unknown

6. Occupant's Sex: 2
   (1) Male
   (2) Female
   (9) Unknown

7. Occupant's Height: 62
   Code actual height to the nearest inch.
   (99) Unknown

8. Occupant's Weight: 125
   Code actual weight to the nearest pounds.
   (999) Unknown

9. Occupant's Role: 1
   (1) Driver
   (2) Passenger
   (9) Unknown

10. Occupant's Seat Position: 11
    Front Seat
    (11) Left side
    (12) Middle
    (13) Right side
    (14) Other (specify):
    (15) On or in the lap of another occupant

    Second Seat
    (21) Left side
    (22) Middle
    (23) Right side
    (24) Other (specify):
    (25) On or in the lap of another occupant

    Third Seat
    (31) Left side
    (32) Middle
    (33) Right side
    (34) Other (specify):
    (35) On or in the lap of another occupant

    Fourth Seat
    (41) Left side
    (42) Middle
    (43) Right side
    (44) Other (specify):
    (45) On or in the lap of another occupant

    (97) In or on unenclosed area
    (98) Other seat (specify):
    (99) Unknown

11. Occupant Posture: 0
    (0) Normal posture
    (1) Abnormal posture (specify):
    (9) Unknown

EJECTION/ENTRAPMENT

12. Ejection: 0
    (0) No ejection
    (1) Complete ejection
    (2) Partial ejection
    (3) Ejection, unknown degree
    (9) Unknown

13. Ejection Area: 0
    (0) No ejection
    (1) Windshield
    (2) Left front
    (3) Right front
    (4) Left rear
    (5) Right rear
    (6) Rear
    (7) Roof
    (8) Other area (e.g., back of pickup, etc.) (specify):
    (9) Unknown

14. Ejection Medium: 0
    (0) No ejection
    (1) Door/hatch/tailgate
    (2) Nonfixed roof structure
    (3) Fixed glazing
    (4) Nonfixed glazing (specify):
    (5) Integral structure
    (8) Other medium (specify):
    (9) Unknown

15. Medium Status (Immediately Prior To Impact): 0
    (0) No ejection
    (1) Open
    (2) Closed
    (3) Integral structure
    (9) Unknown

16. Entrapment: 0
    (NOTE: Entrapped means that part of the person was in the vehicle and mechanically restrained; jammed doors and immobilizing injuries by themselves are not sufficient to constitute entrapment.)
    (0) Not entrapped
    (1) Entrapped
    (9) Unknown

RESTRAINT SYSTEM AND SEAT EVALUATION

17. Manual (Active) Belt System Availability 3
(0) None available
(1) Belt removed/destroyed
(2) Shoulder belt
(3) Lap belt
(4) Lap and shoulder belt
(5) Belt available—type unknown

Integral Belt Partially Destroyed
(6) Shoulder belt (lap belt destroyed/removed)
(7) Lap belt (shoulder belt destroyed/removed)

(8) Other belt (specify): _____

(9) Unknown

18. Manual (Active) Belt System Use 03
(00) None used, not available, or belt removed/destroyed
(01) Inoperative (specify): _____

(02) Shoulder belt
(03) Lap belt
(04) Lap and shoulder belt
(05) Belt used—type unknown
(08) Other belt used (specify): _____

(12) Shoulder belt used with child safety seat
(13) Lap belt used with child safety seat
(14) Lap and shoulder belt used with child safety seat
(15) Belt used with child safety seat—type unknown
(18) Other belt used with child safety seat (specify): _____
(99) Unknown if belt used

19. Proper Use of Manual (Active) Belts 1
(0) None used or not available
(1) Belt used properly
(2) Belt used properly with child safety seat

Belt Used Improperly
(3) Shoulder belt worn under arm
(4) Shoulder belt worn behind back or seat
(5) Belt worn around more than one person
(6) Lap belt worn on abdomen
(7) Lap belt or lap and shoulder belt used improperly with child safety seat (specify): _____

(8) Other improper use of manual belt system (specify): _____

(9) Unknown

20. Manual (Active) Belt Failure Modes During Accident 1
(0) No manual belt used
(1) No manual belt failure(s)
(2) Torn webbing (stretched webbing not included)
(3) Broken buckle or latchplate
(4) Upper anchorage separated
(5) Other anchorage separated (specify): _____

(6) Broken retractor
(7) Combination of above (specify): _____

(8) Other manual belt failure (specify): _____

(9) Unknown

21. Air Bag System Availability/Function 0
(0) Not equipped/not available
(1) Air bag

Non-functional
(2) Air bag disconnected (specify): _____

(3) Air bag not reinstalled
(9) Unknown

22. Air Bag System Deployment 0
(0) Not equipped/not available
(1) Air bag deployed during accident (as a result of impact)
(2) Air bag deployed inadvertently just prior to accident
(3) Air bag deployed, accident sequence undetermined
(4) Nondeployed
(5) Unknown if deployed
(6) Air bag deployed as a result of a noncollision event during accident sequence (e.g., fire, explosion, electrical)
(9) Unknown

23. Did Air Bag System Fail? 0
(0) Not equipped/not available
(1) No
(2) Yes (specify): _____

(9) Unknown

Note: See Variables 44 through 48 (Page 5) for Information on Automatic Belts

24. Police Reported Restraint Use 9
(0) None used
(1) Police did not indicate restraint use
(2) Shoulder belt
(3) Lap belt
(4) Lap and shoulder belt
(5) Belt used, type not specified
(6) Child safety seat
(7) Other or automatic restraint (specify): _____

(8) Restrained, type unknown
(9) Police indicated "unknown"

25. Head Restraint Type/Damage by Occupant at This Occupant Position 0
(0) No head restraints
(1) Integral—no damage
(2) Integral—damaged during accident
(3) Adjustable—no damage
(4) Adjustable—damaged during accident
(5) Add-on—no damage
(6) Add-on—damaged during accident
(8) Other (specify): _____

(9) Unknown

26. Seat Type (this Occupant Position) 0 8
(00) Occupant not seated or no seat
(01) Bucket
(02) Bucket with folding back
(03) Bench
(04) Bench with separate back cushions
(05) Bench with folding back(s)
(06) Split bench with separate back cushions
(07) Split bench with folding back(s)
(08) Pedestal (i.e., column supported)
(09) Other seat type (specify):
_____
(10) Box mounted seat (i.e., van type)
(99) Unknown

27. Seat Performance (this Occupant Position) 1
(0) Occupant not seated or no seat
(1) No seat performance failure(s)
(2) Seat adjusters failed
(3) Seat back folding locks or "seat back" failed
(4) Seat track/anchors failed
(5) Deformed by impact of occupant
(6) Deformed by passenger compartment intrusion (specify):_____
_____
_____
(7) Combination of above (specify):
_____
(8) Other (specify):
_____
(9) Unknown

CHILD SAFETY SEAT

28. Child Safety Seat Make/Model 0 0 0
(000) No child safety seat
Applicable codes are found in your NASS CDS Data Collection, Coding and Editing
(950) Built-in child safety seat
(997) Other make/model (specify):
_____
(998) Unknown make/model
(999) Unknown if child safety seat used

29. Type of Child Safety Seat 0
(0) No child safety seat
(1) Infant seat
(2) Toddler seat
(3) Convertible seat
(4) Booster seat
(7) Other type child safety seat (specify):
_____
(8) Unknown child safety seat type
(9) Unknown if child safety seat used

30. Child Safety Seat Orientation 0 0
(00) No child safety seat

Designed for Rear Facing for This Age/Weight
(01) Rear facing
(02) Forward facing
(08) Other orientation (specify):
_____
(09) Unknown orientation

Designed For Forward Facing for This Age/Weight
(11) Rear facing
(12) Forward facing
(18) Other orientation (specify):
_____
(19) Unknown orientation

Unknown Design or Orientation For This Age/Weight, or Unknown Age/Weight
(21) Rear facing
(22) Forward facing
(28) Other orientation (specify):
_____
(29) Unknown orientation

(99) Unknown if child safety seat used

31. Child Safety Seat Harness Usage 0 0

32. Child Safety Seat Shield Usage 0 0

33. Child Safety Seat Tether Usage 0 0
Note: Options below applicable to Variables OA31-OA33.
(00) No child safety seat

Not Designed With Harness/Shield/Tether
(01) After market harness/shield/tether added, not used
(02) After market harness/shield/tether used
(03) Child safety seat used, but no after market harness/shield/tether added
(09) Unknown if harness/shield/tether added or used

Designed With Harness/Shield/Tether
(11) Harness/shield/tether not used
(12) Harness/shield/tether used
(19) Unknown if harness/shield/tether used

Unknown If Designed With Harness/Shield/Tether
(21) Harness/shield/tether not used
(22) Harness/shield/tether used
(29) Unknown if harness/shield/tether used

(99) Unknown if child safety seat used

INJURY CONSEQUENCES

34. Injury Severity (Police Rating) 0

(0) O - No injury
(1) C - Possible injury
(2) B - Nonincapacitating injury
(3) A - Incapacitating injury
(4) K - Killed
(5) U - Injury, severity unknown
(6) Died prior to accident
(9) Unknown

35. Treatment - Mortality 0

(0) No treatment
(1) Fatal
(2) Fatal - ruled disease

Nonfatal
(3) Hospitalization
(4) Transported and released
(5) Treatment at scene - nontransported
(6) Treatment later
(8) Treatment - other (specify):

_____
(9) Unknown

36. Type Of Medical Facility (for Initial Treatment) 0

(0) Not treated at a medical facility
(1) Trauma center
(2) Hospital
(3) Medical clinic
(4) Physician's office
(5) Treatment later at medical facility
(8) Other (specify):

_____
(9) Unknown

37. Hospital Stay 0 0

(00) Not Hospitalized
_____Code the number of days (up through 60) that the occupant stayed in hospital.
(61) 61 days or more
(99) Unknown

38. Working Days Lost 9 9

_____Code the number of days (up through 60) that the occupant lost from work due to the accident
(00) No working days lost
(61) 61 days or more
(62) Fatally injured
(97) Not working prior to accident
(99) Unknown

39. Time to Death 0 0

_____Code number of hours from time of accident to time of death up through 24 hours. If time of death is greater than 24 hours, code number of days. (Note: 1 day = 31, 2 days = 32, ... n days = 30 +n up through 30 days = 60)
(00) Not fatal
(96) Fatal - ruled disease
(99) Unknown

40. 1st Medically Reported Cause of Death 0 0

41. 2nd Medically Reported Cause of Death 0 0

42. 3rd Medically Reported Cause of Death 0 0

_____Code the Occupant Injury from line number(s) for the medically reported injury(s) which reportedly contributed to this occupant's death
(00) Not fatal or no additional causes
(97) Other result (specify):

_____
(99) Unknown

43. Number of Recorded Injuries for This Occupant 0 0

_____Code the actual number of injuries recorded for this occupant.
(00) No recorded injuries
(97) Injured, details unknown
(99) Unknown if injured

AUTOMATIC BELT SYSTEM

44. Automatic (Passive) Belt System Availability/ Function [0]
(0) Not equipped/not available
(1) 2 point automatic belts
(2) 3 point automatic belts
(3) Automatic belts - type unknown

Non-functional
(4) Automatic belts destroyed or rendered inoperative
(9) Unknown

45. Automatic (Passive) Belt System Use [0]
(0) Not equipped/not available/destroyed or rendered inoperative
(1) Automatic belt in use
(2) Automatic belt not in use (manually disconnected, motorized track inoperative) (specify):

(3) Automatic belt use unknown
(9) Unknown

46. Automatic (Passive) Belt System Type [0]
(0) Not equipped/not available
(1) Non-motorized system
(2) Motorized system
(9) Unknown

47. Proper Use of Automatic (Passive Belt System [0]
(0) Not equipped/not available/not used
(1) Automatic belt used properly
(2) Automatic belt used properly with child safety seat

Automatic Belt Used Improperly
(3) Automatic shoulder belt worn under arm
(4) Automatic shoulder belt worn behind back
(5) Automatic belt worn around more than one person
(6) Lap portion of automatic belt worn on abdomen
(7) Automatic lap and shoulder belt or automatic shoulder belt used improperly with child safety seat (specify):

(8) Other improper use of automatic belt system (specify):
(9) Unknown

48. Automatic (Passive) Belt Failure Modes During Accident [0]
(0) Not equipped/not available/not in use
(1) No automatic belt failure(s)
(2) Torn webbing (stretched webbing not included)
(3) Broken buckle or latchplate
(4) Upper anchorage separated
(5) Other anchorage separated (specify):

(6) Broken retractor
(7) Combination of above (specify):
(8) Other automatic belt failure (specify):

(9) Unknown

49. Seat Orientation (this Occupant Position) [1]
(0) Occupant not seated or no seat
(1) Forward facing seat
(2) Rear facing seat
(3) Side facing seat (inward)
(4) Side facing seat (outward)
(8) Other (specify):

(9) Unknown

TRAUMA DATA

50. Glasgow Coma Scale (GCS) Score (at Medical Facility) [0 0]
(00) Not injured
(01) Injured - not treated at medical facility
(02) No GCS Score at medical facility
(03-15) Code the actual value of the initial GCS Score recorded at medical facility.
(97) Injured, details unknown
(99) Unknown if injured

51. Was the Occupant Given Blood? [1]
(1) No - blood not given
(2) Yes - blood given (specify units):
(9) Unknown if blood given

52. Arterial Blood Gases (ABG) - HCO_3 [0 0]
(00) Not injured
(01) Injured, ABGs not measured or reported
(02-50) Code the actual value of the HCO_3
(96) ABGs reported , HCO_3 unknown
(97) Injured, details unknown
(99) Unknown if injured

UPDATE CANDIDATE? NO [✓] YES [ ]

OCCUPANT INJURY FORM INCLUDED WITH INITIAL SUBMISSION? NO [ ] YES [ ]

***** STOP HERE *****
IF THERE ARE NO RECORDED INJURIES
(I.E., OA43 = 00,97,99)

Appendix F:

NASS Occupant Forms: Pedestrian

U.S. Department of Transportation
National Highway Traffic Safety Administration

OCCUPANT ASSESSMENT FORM

Form Approved
O.M.B. No. 2127-0021

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. Primary Sampling Unit Number: 10
2. Case Number - Stratum: 9210
3. Vehicle Number: XX
4. Occupant Number: (PEDESTRIAN) 01

OCCUPANT'S CHARACTERISTICS

5. Occupant's Age: 06
Code actual age at time of accident.
(00) Less than one year old (specify by month):
(97) 97 years and older
(99) Unknown

6. Occupant's Sex: 2
(1) Male
(2) Female
(9) Unknown

7. Occupant's Height: 99
Code actual height to the nearest inch.
(99) Unknown

8. Occupant's Weight: 999
Code actual weight to the nearest pounds.
(999) Unknown

9. Occupant's Role: X
(1) Driver
(2) Passenger
(9) Unknown

10. Occupant's Seat Position: XX
Front Seat
(11) Left side
(12) Middle
(13) Right side
(14) Other (specify):
(15) On or in the lap of another occupant

Second Seat
(21) Left side
(22) Middle
(23) Right side
(24) Other (specify):
(25) On or in the lap of another occupant

Third Seat
(31) Left side
(32) Middle
(33) Right side
(34) Other (specify):
(35) On or in the lap of another occupant

Fourth Seat
(41) Left side
(42) Middle
(43) Right side
(44) Other (specify):
(45) On or in the lap of another occupant

(97) In or on unenclosed area
(98) Other seat (specify):
(99) Unknown

11. Occupant Posture: X
(0) Normal posture
(1) Abnormal posture (specify):
(9) Unknown

EJECTION/ENTRAPMENT

12. Ejection: X
(0) No ejection
(1) Complete ejection
(2) Partial ejection
(3) Ejection, unknown degree
(9) Unknown

13. Ejection Area: X
(0) No ejection
(1) Windshield
(2) Left front
(3) Right front
(4) Left rear
(5) Right rear
(6) Rear
(7) Roof
(8) Other area (e.g., back of pickup, etc.) (specify):
(9) Unknown

14. Ejection Medium: X
(0) No ejection
(1) Door/hatch/tailgate
(2) Nonfixed roof structure
(3) Fixed glazing
(4) Nonfixed glazing (specify):
(5) Integral structure
(8) Other medium (specify):
(9) Unknown

15. Medium Status (Immediately Prior To Impact): X
(0) No ejection
(1) Open
(2) Closed
(3) Integral structure
(9) Unknown

16. Entrapment: X
(NOTE: Entrapped means that part of the person was in the vehicle and mechanically restrained; jammed doors and immobilizing injuries by themselves are not sufficient to constitute entrapment.)
(0) Not entrapped
(1) Entrapped
(9) Unknown

RESTRAINT SYSTEM AND SEAT EVALUATION

17. Manual (Active) Belt System Availability
(0) None available
(1) Belt removed/destroyed
(2) Shoulder belt
(3) Lap belt
(4) Lap and shoulder belt
(5) Belt available—type unknown

Integral Belt Partially Destroyed
(6) Shoulder belt (lap belt destroyed/removed)
(7) Lap belt (shoulder belt destroyed/removed)

(8) Other belt (specify):

(9) Unknown

18. Manual (Active) Belt System Use
(00) None used, not available, or belt removed/destroyed
(01) Inoperative (specify):

(02) Shoulder belt
(03) Lap belt
(04) Lap and shoulder belt
(05) Belt used—type unknown
(08) Other belt used (specify):

(12) Shoulder belt used with child safety seat
(13) Lap belt used with child safety seat
(14) Lap and shoulder belt used with child safety seat
(15) Belt used with child safety seat—type unknown
(18) Other belt used with child safety seat (specify):
(99) Unknown if belt used

19. Proper Use of Manual (Active) Belts
(0) None used or not available
(1) Belt used properly
(2) Belt used properly with child safety seat

Belt Used Improperly
(3) Shoulder belt worn under arm
(4) Shoulder belt worn behind back or seat
(5) Belt worn around more than one person
(6) Lap belt worn on abdomen
(7) Lap belt or lap and shoulder belt used improperly with child safety seat (specify):

(8) Other improper use of manual belt system (specify):

(9) Unknown

20. Manual (Active) Belt Failure Modes During Accident
(0) No manual belt used
(1) No manual belt failure(s)
(2) Torn webbing (stretched webbing not included)
(3) Broken buckle or latchplate
(4) Upper anchorage separated
(5) Other anchorage separated (specify):

(6) Broken retractor
(7) Combination of above (specify):

(8) Other manual belt failure (specify):

(9) Unknown

21. Air Bag System Availability/Function
(0) Not equipped/not available
(1) Air bag

Non-functional
(2) Air bag disconnected (specify):

(3) Air bag not reinstalled
(9) Unknown

22. Air Bag System Deployment
(0) Not equipped/not available
(1) Air bag deployed during accident (as a result of impact)
(2) Air bag deployed inadvertently just prior to accident
(3) Air bag deployed, accident sequence undetermined
(4) Nondeployed
(5) Unknown if deployed
(6) Air bag deployed as a result of a noncollision event during accident sequence (e.g., fire, explosion, electrical)
(9) Unknown

23. Did Air Bag System Fail?
(0) Not equipped/not available
(1) No
(2) Yes (specify):

(9) Unknown

Note: See Variables 44 through 48 (Page 5) for Information on Automatic Belts

24. Police Reported Restraint Use
(0) None used
(1) Police did not indicate restraint use
(2) Shoulder belt
(3) Lap belt
(4) Lap and shoulder belt
(5) Belt used, type not specified
(6) Child safety seat
(7) Other or automatic restraint (specify):

(8) Restrained, type unknown
(9) Police indicated "unknown"

25. Head Restraint Type/Damage by Occupant at This Occupant Position
(0) No head restraints
(1) Integral—no damage
(2) Integral—damaged during accident
(3) Adjustable—no damage
(4) Adjustable—damaged during accident
(5) Add-on—no damage
(6) Add-on—damaged during accident
(8) Other (specify):

(9) Unknown

26. Seat Type (this Occupant Position)
(00) Occupant not seated or no seat
(01) Bucket
(02) Bucket with folding back
(03) Bench
(04) Bench with separate back cushions
(05) Bench with folding back(s)
(06) Split bench with separate back cushions
(07) Split bench with folding back(s)
(08) Pedestal (i.e., column supported)
(09) Other seat type (specify):
_____
(10) Box mounted seat (i.e., van type)
(99) Unknown

27. Seat Performance (this Occupant Position)
(0) Occupant not seated or no seat
(1) No seat performance failure(s)
(2) Seat adjusters failed
(3) Seat back folding locks or "seat back" failed
(4) Seat track/anchors failed
(5) Deformed by impact of occupant
(6) Deformed by passenger compartment intrusion (specify):_____
_____
_____
(7) Combination of above (specify):
_____
(8) Other (specify):
_____
(9) Unknown

CHILD SAFETY SEAT

28. Child Safety Seat Make/Model
(000) No child safety seat
Applicable codes are found in your NASS CDS Data Collection, Coding and Editing
(950) Built-in child safety seat
(997) Other make/model (specify):
_____
(998) Unknown make/model
(999) Unknown if child safety seat used

29. Type of Child Safety Seat
(0) No child safety seat
(1) Infant seat
(2) Toddler seat
(3) Convertible seat
(4) Booster seat
(7) Other type child safety seat (specify):
_____
(8) Unknown child safety seat type
(9) Unknown if child safety seat used

30. Child Safety Seat Orientation
(00) No child safety seat

Designed for Rear Facing for This Age/Weight
(01) Rear facing
(02) Forward facing
(08) Other orientation (specify):
_____
(09) Unknown orientation

Designed For Forward Facing for This Age/Weight
(11) Rear facing
(12) Forward facing
(18) Other orientation (specify):
_____
(19) Unknown orientation

Unknown Design or Orientation For This Age/Weight, or Unknown Age/Weight
(21) Rear facing
(22) Forward facing
(28) Other orientation (specify):
_____
(29) Unknown orientation

(99) Unknown if child safety seat used

31. Child Safety Seat Harness Usage

32. Child Safety Seat Shield Usage

33. Child Safety Seat Tether Usage
Note: Options below applicable to Variables OA31-OA33.
(00) No child safety seat

Not Designed With Harness/Shield/Tether
(01) After market harness/shield/tether added, not used
(02) After market harness/shield/tether used
(03) Child safety seat used, but no after market harness/shield/tether added
(09) Unknown if harness/shield/tether added or used

Designed With Harness/Shield/Tether
(11) Harness/shield/tether not used
(12) Harness/shield/tether used
(19) Unknown if harness/shield/tether used

Unknown If Designed With Harness/Shield/Tether
(21) Harness/shield/tether not used
(22) Harness/shield/tether used
(29) Unknown if harness/shield/tether used

(99) Unknown if child safety seat used

INJURY CONSEQUENCES

34. Injury Severity (Police Rating) 4

(0) O - No injury
(1) C - Possible injury
(2) B - Nonincapacitating injury
(3) A - Incapacitating injury
(4) K - Killed
(5) U - Injury, severity unknown
(6) Died prior to accident
(9) Unknown

35. Treatment - Mortality 0
(0) No treatment
(1) Fatal
(2) Fatal - ruled disease

Nonfatal
(3) Hospitalization
(4) Transported and released
(5) Treatment at scene - nontransported
(6) Treatment later
(8) Treatment - other (specify):

_____
(9) Unknown

36. Type Of Medical Facility (for Initial Treatment) 0
(0) Not treated at a medical facility
(1) Trauma center
(2) Hospital
(3) Medical clinic
(4) Physician's office
(5) Treatment later at medical facility
(8) Other (specify):

_____
(9) Unknown

37. Hospital Stay 0 0
(00) Not Hospitalized
____Code the number of days (up through 60) that the occupant stayed in hospital.
(61) 61 days or more
(99) Unknown

38. Working Days Lost 9 7
____Code the number of days (up through 60) that the occupant lost from work due to the accident
(00) No working days lost
(61) 61 days or more
(62) Fatally injured
(97) Not working prior to accident
(99) Unknown

39. Time to Death 0 1
____Code number of hours from time of accident to time of death up through 24 hours. If time of death is greater than 24 hours, code number of days. (Note: 1 day = 31, 2 days = 32, ... n days = 30 +n up through 30 days = 60)
(00) Not fatal
(96) Fatal - ruled disease
(99) Unknown

40. 1st Medically Reported Cause of Death 9 9

41. 2nd Medically Reported Cause of Death 0 0

42. 3rd Medically Reported Cause of Death 0 0
____Code the Occupant Injury from line number(s) for the medically reported injury(s) which reportedly contributed to this occupant's death
(00) Not fatal or no additional causes
(97) Other result (specify):

_____
(99) Unknown Lay Coroner only!

43. Number of Recorded Injuries for This Occupant 0 6
6 Code the actual number of injuries recorded for this occupant.
(00) No recorded injuries
(97) Injured, details unknown
(99) Unknown if injured

AUTOMATIC BELT SYSTEM

44. Automatic (Passive) Belt System Availability/ Function X
    (0) Not equipped/not available
    (1) 2 point automatic belts
    (2) 3 point automatic belts
    (3) Automatic belts - type unknown

    Non-functional
    (4) Automatic belts destroyed or rendered inoperative
    (9) Unknown

45. Automatic (Passive) Belt System Use X
    (0) Not equipped/not available/destroyed or rendered inoperative
    (1) Automatic belt in use
    (2) Automatic belt not in use (manually disconnected, motorized track inoperative) (specify):
    (3) Automatic belt use unknown
    (9) Unknown

46. Automatic (Passive) Belt System Type X
    (0) Not equipped/not available
    (1) Non-motorized system
    (2) Motorized system
    (9) Unknown

47. Proper Use of Automatic (Passive Belt System X
    (0) Not equipped/not available/not used
    (1) Automatic belt used properly
    (2) Automatic belt used properly with child safety seat

    Automatic Belt Used Improperly
    (3) Automatic shoulder belt worn under arm
    (4) Automatic shoulder belt worn behind back
    (5) Automatic belt worn around more than one person
    (6) Lap portion of automatic belt worn on abdomen
    (7) Automatic lap and shoulder belt or automatic shoulder belt used improperly with child safety seat (specify):
    (8) Other improper use of automatic belt system (specify):
    (9) Unknown

48. Automatic (Passive) Belt Failure Modes During Accident X
    (0) Not equipped/not available/not in use
    (1) No automatic belt failure(s)
    (2) Torn webbing (stretched webbing not included)
    (3) Broken buckle or latchplate
    (4) Upper anchorage separated
    (5) Other anchorage separated (specify):
    (6) Broken retractor
    (7) Combination of above (specify):
    (8) Other automatic belt failure (specify):
    (9) Unknown

49. Seat Orientation (this Occupant Position) X
    (0) Occupant not seated or no seat
    (1) Forward facing seat
    (2) Rear facing seat
    (3) Side facing seat (inward)
    (4) Side facing seat (outward)
    (8) Other (specify):
    (9) Unknown

TRAUMA DATA

50. Glasgow Coma Scale (GCS) Score (at Medical Facility) 01
    (00) Not injured
    (01) Injured - not treated at medical facility
    (02) No GCS Score at medical facility
    (03-15) Code the actual value of the initial GCS Score recorded at medical facility.
    (97) Injured, details unknown
    (99) Unknown if injured

51. Was the Occupant Given Blood? 1
    (1) No - blood not given
    (2) Yes - blood given (specify units):
    (9) Unknown if blood given

52. Arterial Blood Gases (ABG) - HCO_3 01
    (00) Not injured
    (01) Injured, ABGs not measured or reported
    (02-50) Code the actual value of the HCO_3
    (96) ABGs reported , HCO_3 unknown
    (97) Injured, details unknown
    (99) Unknown if injured

UPDATE CANDIDATE? NO [✓] YES [ ]

OCCUPANT INJURY FORM INCLUDED WITH INITIAL SUBMISSION? NO [ ] YES [✓]

***** STOP HERE *****
IF THERE ARE NO RECORDED INJURIES
(I.E., OA43 = 00,97,99)

U.S. Department of Transportation
National Highway Traffic Safety Administration

OCCUPANT INJURY FORM

Form Approved
O.M.B. No. 2127-0021

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. Primary Sampling Unit Number	10	3. Vehicle Number	X
2. Case Number - Stratum	9210	4. Occupant Number	01

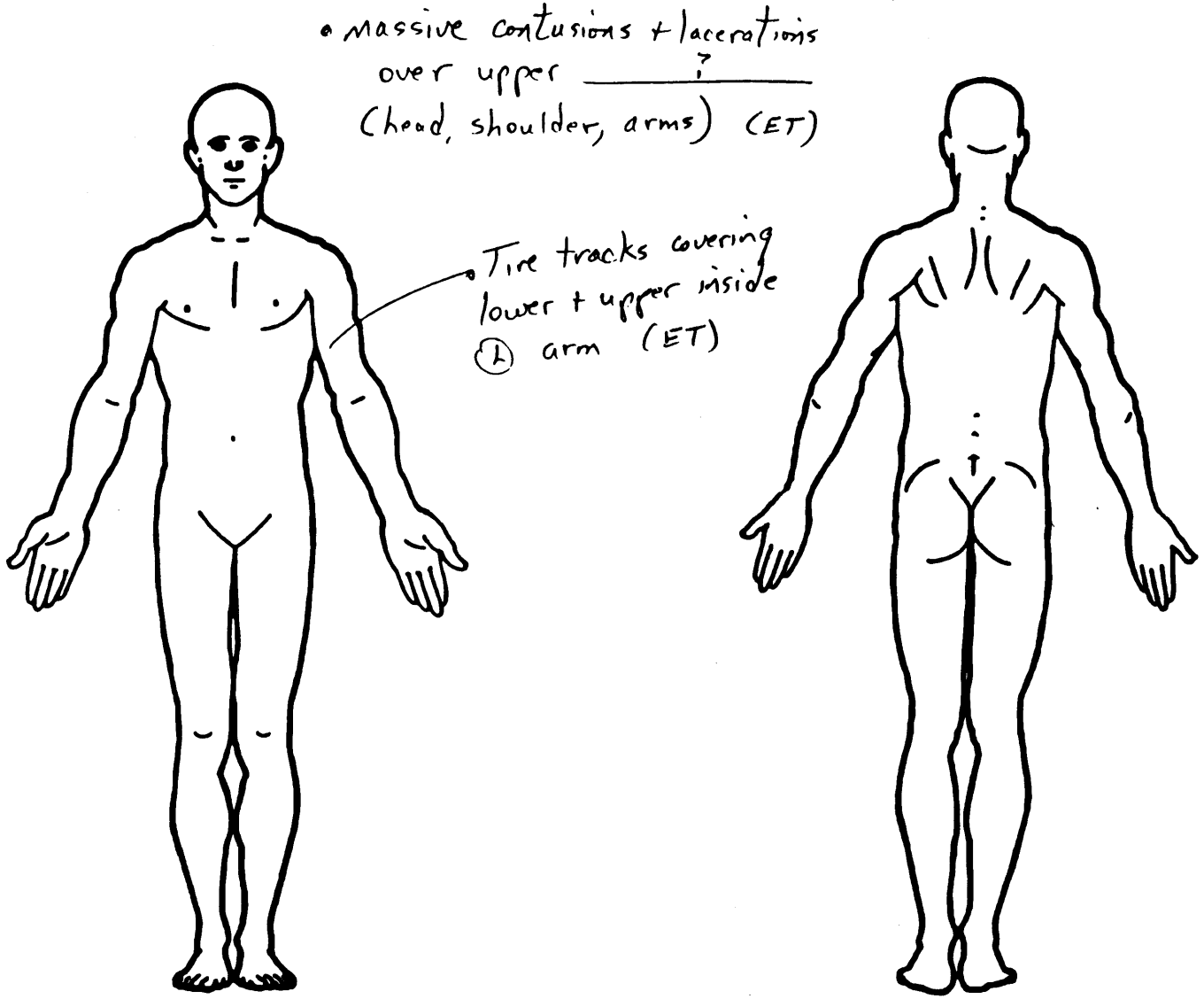
INJURY DATA

Record below the actual injuries sustained by this occupant that were identified from the official and unofficial data sources. Remember not to double count an injury just because it was identified from two different sources. If greater than ten injuries have been documented, encode the balance on the Occupant Injury Supplement.

	Source of Injury Data	O.I.C.-A.I.S Body Region	Aspect	Lesion	System Organ	A.I.S. Severity	Injury Source	Injury Source Confidence Level	Direct/ Indirect Injury	Occupant Area Intrusion No.
1st	5. 3	6. H	7. W	8. N	9. W	10. 6	11. 81	12. 1	13. 1	14. ØØ
2nd	15. 3	16. F	17. W	18. F	19. 5	20. 3	21. 81	22. 1	23. 1	24. ØØ
3rd	25. 6	26. S	27. U	28. C	29. I	30. 1	31. 81	32. 1	33. 1	34. ØØ
4th	35. 6	36. S	37. U	38. L	39. I	40. 1	41. 81	42. 1	43. 1	44. ØØ
5th	45. 6	46. X	47. U	48. C	49. I	50. 1	51. 81	52. 1	53. 1	54. ØØ
6th	55. 6	56. X	57. U	58. L	59. I	60. 1	61. 81	62. 1	63. 1	64. ØØ
7th	65.	66.	67.	68.	69.	70.	71.	72.	73.	74.
8th	75.	76.	77.	78.	79.	80.	81.	82.	83.	84.
9th	85.	86.	87.	88.	89.	90.	91.	92.	93.	94.
10th	95.	96.	97.	98.	99.	100.	101.	102.	103.	104.

OFFICIAL INJURY DATA — SOFT TISSUE INJURIES

Indicate the Location, Lesion, Detail (size, depth, fracture type, head injury clinical signs and neurological deficits), and Source of all injuries indicated by official sources (or from PAR or other unofficial sources if medical records and interviewee data are unavailable.)



OFFICIAL INJURY DATA — SKELETAL INJURIES

Restrained?

— No NA
— Yes

Blood Alcohol Level (mg/dl)

BAL = —
Not Measured

Glasgow Coma Scale Score

GCSS = DOA

Units of Blood Given

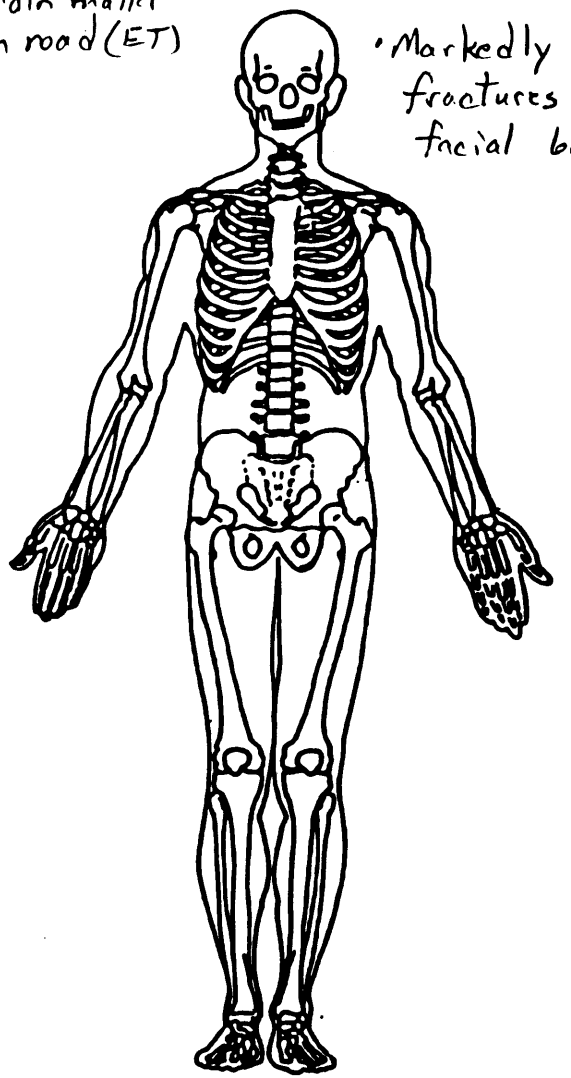
Units = 0

Aterial Blood Gases

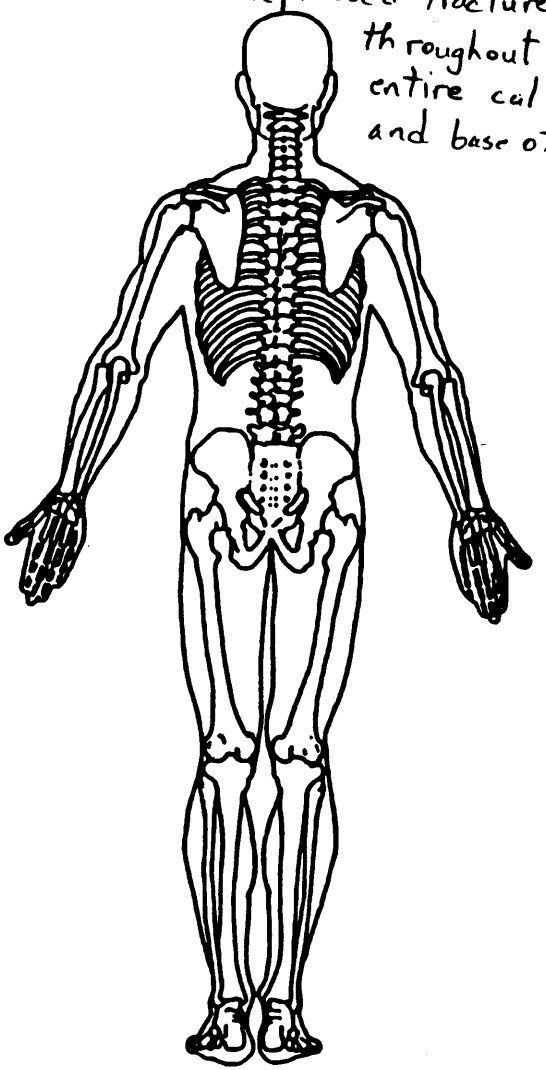
pH = —.—
PO_2 = —
PCO_2 —
HCO_3 —
Not Measured

Indicate the Location, Lesion, Detail (size, depth, fracture type, head injury clinical signs and neurological deficits), and Source of all injuries indicated by official sources (or from PAR or other unofficial sources if medical records and interviewee data are unavailable.)

- Skull open Fx with brain matter on road (ET)
- Markedly comminuted fractures involving facial bones (EX)

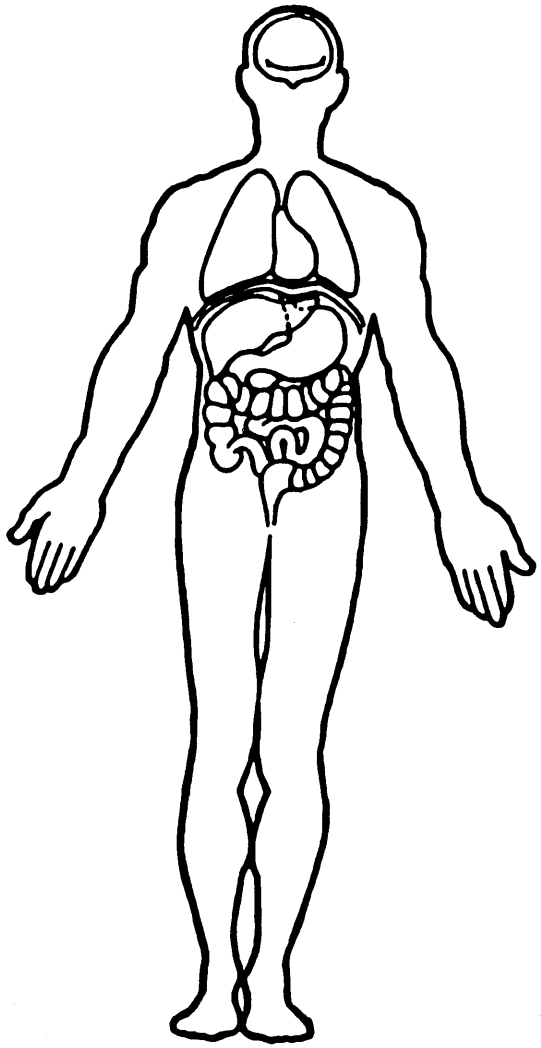


- Markedly comminuted, depressed fractures throughout the entire calvarium and base of skull (EX)

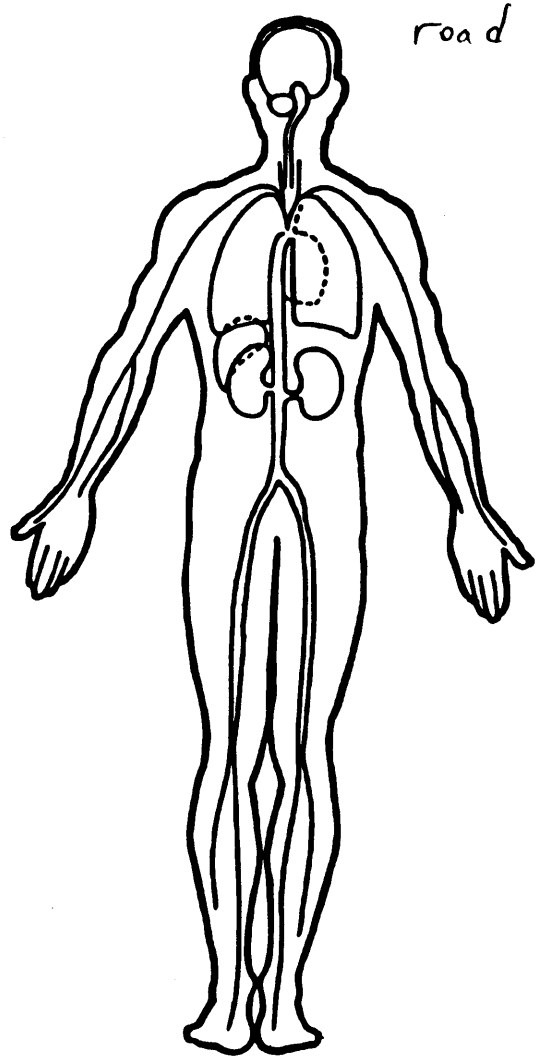


OFFICIAL INJURY DATA —INTERNAL INJURIES

Indicate the Location, Lesion, Detail (size, depth, fracture type, head injury clinical signs and neurological deficits), and Source of all injuries indicated by official sources (or from PAR or other unofficial sources if medical records and interviewee data are unavailable.)



• Brain matter on road (ET)



BEST AVAILABLE

STATE BOARD OF HEALTH

CERTIFICATE OF DEATH

State No. .....

TYPE/PRINT IN PERMANENT BLACK INK

DECEDENT

1 DECEASED—NAME (First, Middle, Last): [redacted]

2 SEX: Female

3a TIME OF DEATH: [redacted]

3b DATE OF DEATH (Month, Day, Yr.): 1992

4 SOCIAL SECURITY NUMBER: [redacted]

5a AGE—Last Birthday (Years): 6

5b UNDER 1 YEAR: Months / Days

5c UNDER 1 DAY: Hours / Minutes

6 DATE OF BIRTH (Mo. Day Yr.): [redacted]

7 BIRTHPLACE (City and State or Foreign Country): [redacted]

8a WAS DECEDENT A US VETERAN?: No

8b YEAR LAST SERVED IN US ARMED FORCES?: N/A

8e PLACE OF DEATH (Check only one. See instructions)

HOSPITAL ☐ Inpatient ☐ ER/Outpatient ☐ DOA

OTHER ☐ Nursing Home ☒ Residence ☐ Other (Specify)

9b FACILITY NAME (If not institution, give street and number): [redacted]

9c CITY, TOWN OR LOCATION OF DEATH:

9d COUNTY OF DEATH:

10 MARITAL STATUS (Specify): Never Married

11 SURVIVING SPOUSE (If wife, give maiden name): NONE

12a DECEDENT'S USUAL OCCUPATION (Give kind of work done during most of working life. Do not use retired): student

12b KIND OF BUSINESS/INDUSTRY: education

13a RESIDENCE—STATE:

13b COUNTY:

13c CITY, TOWN OR LOCATION:

13d STREET AND NUMBER: [redacted]

13e ZIP CODE: [redacted]

13f INSIDE CITY LIMITS ☐ No ☒ Yes

13g ON A FARM? ☐ No ☐ Yes

14 CITIZEN OF WHAT COUNTRY?: USA

15 WAS DECEDENT OF HISPANIC ORIGIN? ☒ No ☐ Yes (If yes, specify Cuban, Mexican, Puerto Rican, etc.)

16 RACE—American Indian, Black, White, etc. (Specify): White

17 DECEDENT'S EDUCATION (Specify only highest grade completed)

Elementary/Secondary (0-12): 1

College (1-4 or 5 +):

PARENTS

18 FATHER'S NAME (First, Middle, Last): [redacted]

19 MOTHER'S NAME (First, Middle, Maiden Surname): [redacted]

INFORMANT

20a INFORMANT'S NAME (Type/Print): [redacted]

20b MAILING ADDRESS (Street and Number or Rural Route Number, City or Town, State, Zip Code):

20c Relationship: Father

DISPOSITION

21a METHOD OF DISPOSITION: ☒ Burial ☐ Cremation ☐ Entombment ☐ Removal from State ☐ Donation ☐ Other (Specify) _____

21b DATE AND PLACE OF DISPOSITION (Name of cemetery, crematory or other place): [redacted] 1992 Cemetery

21c LOCATION—City or Town, State:

22a EMBALMER'S NAME: [redacted]

22b EMBALMER'S LICENSE NO: [redacted]

23 WAS DEATH REPORTED TO CORONER? ☐ No ☒ Yes

24a SIGNATURE OF FUNERAL DIRECTOR: [redacted]

24b LICENSE NUMBER (of Licensee): [redacted]

25 NAME, ADDRESS, AND LICENSE NUMBER OF FUNERAL HOME: [redacted]

CAUSE OF DEATH

26 PART I. Enter the diseases, injuries or complications that caused the death. Do not enter nonspecific terms such as cardiac or respiratory arrest, shock or heart failure. List only one cause on each line.

Approximate Interval Between Onset and Death

IMMEDIATE CAUSE (Final disease or condition resulting in death)

a BLUNT FORCE INJURY TO HEAD & NECK

DUE TO (OR AS A CONSEQUENCE OF)

Conditions if any which gave rise to the immediate cause stating the underlying cause last

b

DUE TO (OR AS A CONSEQUENCE OF)

c

DUE TO (OR AS A CONSEQUENCE OF)

d

PART II. Other significant conditions. Conditions contributing to death but not previously stated in Part I.

27 WAS DECEDENT PREGNANT OR 90 DAYS POSTPARTUM? (Yes or no)

28a WAS AN AUTOPSY PERFORMED? (Yes or no): No

28b WERE AUTOPSY FINDINGS AVAILABLE PRIOR TO COMPLETION OF CAUSE OF DEATH? (Yes or no)

CERTIFIER

29a CERTIFIER (Check only one)

☐ CERTIFYING PHYSICIAN To the best of my knowledge death occurred at the time, date and place and due to the cause(s) as stated

☒ HEALTH OFFICER On the basis of examination and/or investigation in my opinion death occurred at the time, date and place and due to the cause(s) as stated

☐ CORONER On the basis of examination and/or investigation in my opinion death occurred at the time, date and place and due to the cause(s) and manner as stated

[redacted]

29c MEDICAL LICENSE NO: N/A

29d DATE SIGNED (Month, Day, Year): 1992

29e NAME AND ADDRESS OF PERSON WHO COMPLETED CAUSE OF DEATH ITEM 26 (Type or Print): [redacted] St., [redacted]

HEALTH OFFICER

31 HEALTH OFFICER'S SIGNATURE:

32 DATE FILED (Month, Day, Year):

CORONER USE ONLY

33 MANNER OF DEATH: ☐ Natural ☒ Accident ☐ Suicide ☐ Homicide ☐ Pending Investigation ☐ Could not be Determined

34a DATE OF INJURY (Month, Day, Year): 92

34b TIME OF INJURY: [redacted] PM

34c INJURY AT WORK? (Yes or no): NO

34d DESCRIBE HOW INJURY OCCURRED: PEDESTRIAN & SCHOOL BUS

34e PLACE OF INJURY—At home, farm, street, factory, office building, etc. (Specify): STREET

34f LOCATION (Street and Number or Rural Route Number, City or Town, State): [redacted]

34g DATE PRONOUNCED DEAD (Month, Day, Year): 1992

34h MOTOR VEHICLE ACCIDENT? (Yes or no) If yes, specify driver, passenger, pedestrian, etc.: YES, PEDESTRIAN

CASE NO. 92-[redacted]

V E R D I C T

==========
STATE OF
COUNTY
==========

==========
CASE OF
[redacted]
==========

==========

FILED ___ 1992

[redacted]

Coroner of County

STATE OF COUNTY ,ss

I, [redacted] Coroner of said County do hereby certify that, in the City of I have caused to be examined the body of [redacted] said to reside at [redacted] RD. [redacted] 46001 and conducted an inquiry into the circumstances of said death, do hereby find that said decedent came to her death at about PM on the 199 at HIGHWAY

CAUSE OF DEATH: BLUNT FORCE INJURY TO HEAD

NATURE OF DEATH:ACCIDENTAL AUTOPSY:No

IN WITNESS WHEREOF, I have hereunto set my hand and seal of office this 1992

Coroner of County

E.M.S.

[redacted]

PARAMEDIC/EMT | PARAMEDIC/EMT | CODE | DATE | UNIT

CERT # [redacted] | CERT # [redacted] | BLS | VEHICLE CERT #

ALS | ROAD CONDITIONS

	TIME OUT	10-23	ENROUTE	10-7 HOSP	HOSPITAL	10-24	10-8 DISTINCT	10-8 ON STATIC
					[redacted]			

PATCHED TO: NORTH of [redacted] ON Rd [redacted] | MILEAGE | ALLERGIES | S.S. # | PHONE

[redacted] | DOB [redacted] | CURRENT MEDICATIONS:

AGE 6 | SEX F

FAMILY DR:

[redacted] STATE ZIP [redacted]

Refusal of Service: I, the undersigned, hereby release the above named department and its personnel from any and all claims in connection with refusal to accept transportation and/or medical service.

Signature _____ Witness: _____

VITAL SIGNS	CALL ORDERED BY		DELIVERED TO			VALUABLE PT. VALUABLES: LIST
WE						
P	/	/	/	/	/	
BP						
RESP						
O2	☐ ROOM AIR ☐ O P AIRWAY	☐ CANNULA L/M	☐ SIMPLE MASK L/M	☐ NON-REBREATHER L/M	☐ E-T TUBE MM	☐ AMBU L/M	RECEIVING NURSE SIGNATURE:

APPEARANCE

SKIN TEMP: ☐ NORMAL ☐ HOT ☐ COLD ☐ DRY ☐ DIAPHORETIC

COLOR: ☐ NORMAL ☐ PALE ☐ MOTTLED ☐ FLUSHED ☐ DUSKY ☐ CYANOTIC

BREATHING

☐ NORMAL ☐ LABORED ☐ SHALLOW ☐ DEEP ☐ RALES ☐ RHONCHI ☐ WHEEZING ☐ STRIDOR

BREATH SOUNDS: ☐ EQUAL ☐ UNEQUAL ☐ ABSENT WHERE _____

GLASGOW COMA SCALE

Eye Opening	Spontaneous	4
	To Voice	3
	To Pain	2
	None	1
Verbal Response	Oriented	5
	Confused	4
	Inappropriate Words	3
	Incomprehensible Words	2
	None	1
Moto-Response	Obeys Commands	6
	Localizes Pain	5
	Withdraws (pain)	4
	Flexion (pain)	3
	Extension (pain)	2
	None	1

Total Trauma Score 1-16

Total Glasgow Coma Scale Point: 14-15 = 5; 11-13 = 4; 8-10 = 3; 5-7 = 2; 3-4 = 1

TRAUMA SCORE

The Trauma Score is a numerical grading system for estimating the severity of injury. The score is composed of the Glasgow Coma Scale (reduced to approximately one third total values and measurements of cardiopulmonary function. Each parameter is given a number (high for normal and low for impaired function). Severity of injury is estimated by summing the numbers. The lowest score is 1, the highest score is 16.

Respiratory Rate	10 - 24 min	4
	25 - 35 min	3
	36 min or greater	2
	1 - 9 min	1
	None	0
Respiratory Expansion	Normal	1
	Retraction	0
Systolic Blood Pressure	90 mmHg or greater	4
	70 - 89 mmHg	3
	50 - 69 mmHg	2
	0 - 49 mmHg	1
	No Pulse	0
Capillary Refill	Normal	1
	Delayed	1
	None	0

PUPILS

TIME _____ R ☐ DILATED I ☐ NORMAL G ☐ CONSTRICTED H ☐ NON-REACTIVE T ☐ CATARACT/BURG ☐ BLIND — ☐ UL ☐ OE ☐ OF ☐ OT ☐

TIME _____ R ☐ DILATED I ☐ NORMAL G ☐ CONSTRICTED H ☐ NON-REACTIVE T ☐ CATARACT/BURG ☐ BLIND — ☐ OL ☐ OE ☐ OF ☐ OT ☐

Glasgow Score

Motor Score _____

Score @ 5 min _____

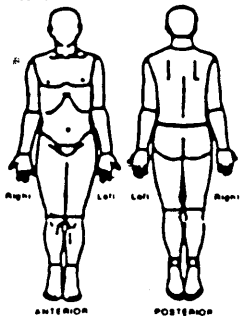
Score @ 10 min _____

Score @ 15 min _____

PATIENT HISTORY: ☐ MI/ASHD ☐ CHF ☐ CVA ☐ HYPERTENSION ☐ COPD ☐ ASTHMA ☐ DIABETIC ☐ SEIZURES ☐ KIDNEY DISEASE ☐ LIVER DISEASE ☐ CA ☐ ETOH ☐ OBS ☐ OTHER ☐ SEE COMMENTS

1 BURN 1° 2 BURN 2° 3 BURN 3° 4 LACERATION 5 ABRASION 6 SIMPLE FX 7 COMPOUND FX 8 GUNSHOT 9 STAB 10 INTERNAL INJ 11 SPINAL INJ 12 PAIN _____ 13 AMPUTATION 14 CONVULSION 15 PARALYSIS 16 OTHER

INJURIES



it is a 6 yo WF who was ran over by a School bus. DRIVER of vehicle states she watched child get off of school bus and walk down driveway. At that point she closed the doors and proceeded forward & TK behind him started around her and she watched him closely because she had to make another stop 2 houses down. At that time the bus felt as it it ran over something and she knew immediately it had to be the child. At had tire tracks covering lower & upper inside (L) arm Skull (open) fracture & brain matter on road Massive contusions & lacerations over upper (head, shoulder, arms) (R) eye protruding. Pronounced DOA at scene. Transported to [redacted] Coroner in attendance. [redacted] EMT

BR CONTRACT ☐ NONE ☐ PHONE ☐ RADIO CHNL ☐ TELEMENTRY ☐ OTHER

DESTINATION | DRIVER [redacted]

EQUIPMENT LEFT @ HOSPITAL

X-RAY REPORT [redacted]

PHONE [redacted]

NAME [redacted]

PROCEDURE NO [redacted]

WP	ROOM NO.	AGE	REFERRING PHYSICIAN	PATIENT NO
		6	Coroner	

DATE OF EXAMINATION: 9 D/T: 92

PORTABLE SKULL

INDICATION: DOA.

REPORT: Portable AP and latearl views of the skull were obtained. There are markedly comminuted, depressed fractures throughout the entire calvarium and base of the skull as well as the facial bones. There is marked displacement of the fracture fragments with compression of the calvarium.

IMPRESSION: Markedly comminuted fractures involving the facial bones and calvarium with depression of the skull.

[redacted]:ci

[redacted] M.D.

RADIOLOGY REPORT PHYSICIAN [redacted] M.D., RADIOLOGIST
M.D., RADIOLOGIST
M.D., RADIOLOGIST

Appendix G:

Federal Register / Vol. 57, No. 232 / Wednesday, December 2, 1992 / Rules and Regulations: Pages 57000 through 57020--Final Rule for FMVSS 111, Rearview Mirrors

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. 89-26; Notice 3]

RIN 2127-AD24

Federal Motor Vehicle Safety Standards; Convex Cross View Mirrors on School Buses

AGENCY: National Highway Traffic Safety Administration (NHTSA), DOT.

ACTION: Final rule.

SUMMARY: This notice amends Federal motor vehicle safety standard No. 111, Rearview Mirrors, with respect to the field-of-view around school buses. The notice amends the standard to require a bus driver to be able to see, either directly or through mirrors, certain specified areas in front of and along both sides of school buses; to specify certain criteria for convex cross view mirrors; and to establish test conditions designed to ensure that the image of an object is sufficiently clear. The amendments will improve the view around stopped school buses, thus reducing the risk of school buses striking student pedestrians.

DATES: *Effective Date:* The amendments become effective December 2, 1993.

Petitions for reconsideration: Any petitions for reconsideration of this rule must be received by NHTSA no later than January 4, 1993

ADDRESS: Any petition for reconsideration should refer to the docket and notice number set forth in the heading of this notice and be submitted to: Administrator, NHTSA, 400 Seventh Street SW., Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Ms. Patricia Breslin, NRM-10, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street SW., Washington, DC 20590, (202) 366-0842.

SUPPLEMENTARY INFORMATION:

Outline

I. Background

School buses provide an extremely safe form of transportation. On a vehicle-mile basis, school buses are about four times safer than passenger cars. Despite this outstanding safety record, injuries and fatalities do occur, with most of them occurring to pedestrians outside the school bus. According to the May 1989 report by the National Academy of Sciences (NAS), "Improving School Bus Safety," an average of 38 pedestrians are killed each year in school bus-related incidents. Of these 38 pedestrian fatalities, an average of 26 result from students being struck by their own school bus and 12 result from being struck by another vehicle. The NAS report also estimated that 283 children suffer mostly minor injuries, when they are struck by their own bus. The NAS report concluded that since children are at greater risk of being killed in school bus loading zones (i.e., boarding and leaving the bus) than on board school buses, "a larger share of the school bus safety effort should be directed to [improving the safety of] bus stops and loading zones."

NAS accordingly made two specific recommendations to NHTSA. First, to reduce the number of students who are struck by vehicles illegally passing a stopped school bus, NAS recommended the establishment of a Federal motor vehicle safety standard requiring the installation of stop signal arms on all new school buses. (The agency has published Federal motor vehicle safety standard 131, "School Bus Pedestrian Safety Devices," which becomes effective for all new school buses produced on or after September 1, 1992. 56 FR 20363, May 3, 1991). Second, to reduce the number of children who are struck by their own school bus, NAS recommended that NHTSA "reexamine its standards for cross view mirrors to determine whether current specifications can be modified to give the driver a better view of the areas in front of and immediately beside the bus."

Federal motor vehicle safety standard No. 111, Rearview Mirrors, (49 CFR 571.111) currently requires each school bus that is not a forward control vehicle, i.e., a transit style bus, to have an outside cross view mirror of a specified size and shape (S9.2), "mounted so as to provide the driver a view of the front bumper and the area in front of the bus" (S9.2(b)). The standard also requires each school bus to have an outside rearview mirror of unit magnification (i.e., flat mirror) on each side of the bus, to provide the driver with a view to the rear along both sides of the bus (S9.1). In addition to meeting the requirements in Standard No. 111, school buses are required by nearly every State to be equipped with additional mirrors, particularly cross view mirrors.

As noted earlier, an average of 26 students are killed each year and 283 are injured each year after being struck by their own school bus. These incidents are rare. Nevertheless, the potential for such tragedies is actually quite large because every time a student gets on or off a school bus, there is a chance that the driver may not see that student in the proximity of the bus. According to the 1989 NAS report, of the 26 students killed as pedestrians each year "two-thirds are struck by the front of the bus and one-third by the rear of the bus, usually the rear wheels." A review of specific incidents reveals that the fatalities occurred because the driver did not see the child in front of or to the side of the bus. In many cases in which the child was struck by the bus's rear wheels, the bus had already left the bus stop. In these cases, the children were typically running after the moving bus and fell under the rear wheels. Such incidents cannot be totally avoided through changes to the mirror requirements, since driver error may be a significant cause of many such incidents. In addition, once the school bus is moving, the driver must focus on other driving actions in addition to looking into the mirror systems to check for students around the outside of the bus. However, to reduce the likelihood of students being struck by their own bus in the school bus loading zone, the agency has conducted this rulemaking to improve the means available for the school bus driver to detect their presence around the stopped bus.

The Kansas Department of Transportation conducts an annual nationwide "School Bus Loading and Unloading Survey" which reviews every school bus pedestrian fatality. This study confirms that a significant, although decreasing, number of pedestrians are killed by school buses. The Kansas data indicate that the number of pupils killed nationwide in school bus loading zones was 45 in 1985, 42 in 1986, 32 in 1987, 16 in 1988, 17 in 1989, and 18 in 1990. The agency believes that the decrease in the number of school bus loading zone fatalities is due to a combination of factors, including the use of more and better mirrors, the increased use of stop signal arms, and improved school bus driver and student training. Despite this trend, this type of incident remains the most common way students are killed in school bus-related incidents. Therefore, the agency has conducted this rulemaking to upgrade Standard No. 111's mirror requirements to reduce further the potential for fatalities and injuries to students by school buses.

II. Previous Agency Action

A. Advance Notice of Proposed Rulemaking

On December 17, 1989, NHTSA published an Advance Notice of Proposed Rulemaking (ANPRM) announcing the agency's interest in measures designed to prevent children from being struck by school buses during and after loading and unloading operations. 54 FR 53127. The ANPRM asked questions about pedestrian safety around school buses to assist the agency in deciding whether to pursue rulemaking on cross view mirror systems and other devices designed to protect pedestrians from being struck by the school bus (e.g., crossing control arms, sensors, or video monitors). Among the issues presented were: (1) The safety need for amending the mirror requirements or for requiring additional equipment such as crossing control arms; (2) the need to develop performance requirements to ensure that a driver sees or is otherwise aware of pedestrians in school bus loading zones; (3) the costs of requiring different types of or additional mirror systems and of requiring other types of equipment; and (4) the potential impact of new requirements on school bus users currently in compliance with FMVSS No. 111 and on current State laws that would differ from the Federal requirements that might be proposed.

The agency received comments from State and local governmental organizations, school bus manufacturers, mirror and other equipment manufacturers, associations, and individuals. The commenters generally agreed that measures should be taken to reduce the number of children struck by school buses and to improve the view of school bus drivers around the school bus while it is in the school bus loading zone. Commenters also addressed other issues raised in the ANPRM, including the need for devices other than mirror systems for increasing school bus drivers' awareness of

children outside of school buses, the benefits from training programs, and the costs of the equipment addressed in the ANPRM.

B. Notice of Proposed Rulemaking

Based on the comments received to the ANPRM and the results of NHTSA research conducted by the Vehicle Research and Test Center (VRTC) on school bus mirror performance ("Ergonomic Research on School Bus Cross View Mirror Systems" DOT–HS–807–676, August 1990), the agency published a Notice of Proposed Rulemaking (NPRM) in the Federal Register. 56 FR 20171, May 2, 1991. The agency had two primary objectives in publishing the NPRM: (1) To improve the capability of school bus drivers to see specified critical areas in front of and alongside of school buses in school bus loading zones, and (2) to propose a performance-oriented standard that would replace the existing requirements that prevented certain new convex cross view mirror designs. The NPRM proposed specific performance requirements to Standard No. 111 to ensure that a seated school bus driver could see, either directly or through mirrors, certain specified areas in front of and alongside of a school bus. The proposal specified certain criteria for convex cross view mirrors and proposed establishing test conditions to ensure that the image of an object in a mirror had sufficient clarity. The NPRM also announced the agency's decision not to proceed further with rulemaking to require school buses to be equipped with other devices such as crossing control arms, sensors, or video monitors.

The agency received comments in response to the NPRM from State and local organizations, school bus manufacturers, equipment manufacturers and suppliers, associations, and other organizations. The commenters generally supported the proposal but provided suggested modifications to various portions of it. The agency has considered all the comments in developing the final rule. The commenters' significant points are addressed below, along with the agency's response.

III. Agency Decision

A. General Considerations

Based on the docket comments and other available information, NHTSA has decided to amend Standard No. 111 with respect to the field-of-view around school buses. This final rule amends the standard to require a bus driver to be able to see, either directly or through mirrors, certain specified areas in front of and along both sides of school buses; to specify certain criteria for convex cross view mirrors; and to establish test conditions designed to ensure that the image of an object is sufficiently clear. Standard No. 111 is also amended to include detailed test procedures to ensure that a school bus provides adequate field-of-view around a stopped school bus, thus reducing the risk of school buses striking student pedestrians.

Among the issues addressed in this notice are the field-of-view performance requirements; the placement and characteristics of cylinders representing the field-of-view requirements; school bus mirror systems including both flat driving mirrors and convex cross view mirrors; specific concerns about convex cross view mirrors including accommodation distance, discontinuities in the surface's slope, adjustment, image quality, and labeling information about their proper use; testing procedures; and the rulemaking's anticipated costs and effective date.

While the final rule essentially adopts the provisions proposed in the NPRM, the final rule does contain several changes as compared to the proposal. Among the more important changes are that the field-of-view requirements include the area near the rear left side of the bus, that the test procedure specifies the stop signal arm be in the retracted position and the front entry door be closed during the testing, that determining the minimum radius of curvature of a mirror be based solely on the distance from the driver's eye location to the mirror surface, that the message about the convex mirror be placed inside the vehicle and be expanded to be more informative, and that testing is allowed at any point within a specified area forward of the 25th percentile adult female driver's eye location, instead of four specific points relative to the eye location.

B. Field-of-view requirements

As explained above, Standard No. 111 currently specifies that each school bus must have an outside rearview mirror of unit magnification (i.e., a flat mirror) on both sides of the bus that "provides the driver a view to the rear along both sides of the vehicle * * *" In addition, each school bus, except for forward control vehicles, must have one convex cross view mirror that complies with detailed specifications and "provide(s) the driver a view of the front bumper and the area in front of the bus."

The NPRM proposed requiring that a school bus driver be able to see, directly or through mirrors, test cylinders representing students in critical areas around the school bus. To effectuate this goal, each school bus would be required to have mirror systems on both the left and right sides of the school bus—a set of driving mirrors to view the sides of the bus and areas to the rear of the bus, and a set of convex cross view mirrors to see specified areas at the left front corner of the bus, in front of the bus, and along the right side of the bus. Areas viewable along the bus's right side via the two mirror systems would be required to overlap, as would the areas visible along the bus's left side. Along each side, the driver would be provided with a view of the ground from the front bumper forward, along the sides of the bus, and extending at least 200 feet rearward from the mirror. The NPRM proposed that the driver must be able to see the entire top surface of the cylinders placed at critical locations around the bus. Compared to the current requirements for school bus mirrors, the proposed field-of-view requirements would extend the areas which must be visible, provide field-of-view requirements applicable to any school bus configuration, and provide greater objectivity. The NPRM asked whether the proposed field-of-view requirements, as expressed through the placement of cylinders, would reasonably represent the locations at which school bus pedestrians need to be seen by the driver during school bus loading and unloading.

With respect to the field-of-view approach, the commenters, including the National School Transportation Association (NSTA), Transport Canada, Mirror Lite, Arizona DOT (Arizona), and the Washington State Superintendent of Public Instruction (Washington State) believed that this approach was appropriate. No commenter opposed the proposed approach. Washington State commented that the proposal would provide a realistic performance standard for mirrors. Transport Canada believed that there was a need to improve the field-of-view for school bus drivers and to provide an objective measurement method for all mirrors on school buses.

After reviewing the comments, NHTSA concludes that establishing performance-based field-of-view requirements for school bus mirror systems is reasonable and appropriate. Such an approach will reduce the risk of injury to student pedestrians, while affording mirror and school bus manufacturers and users greater flexibility

C. Test Cylinders

1. Cylinder Placement

As for the placement of test cylinders used to represent student pedestrians, the NPRM proposed that they be located at specified locations near the bus's front wheels, front bumper, locations forward of the bus, near the front right and left wheels, and near the rear right wheel. These proposed locations were based on narratives in the NAS report and docket comments, the VRTC report, the State of Ohio's regulation, and the Eleventh National Conference of School Transportation. Nevertheless, unlike Ohio's regulation and the Eleventh National Conference's specification, NHTSA proposed specific locations and test procedures for showing compliance with the requirements. In requesting comments about whether the proposal reasonably represented locations where student pedestrians are struck by school buses, the agency expressly asked whether the area near the left rear wheels poses a safety problem.

While commenters generally supported the proposed locations for the test cylinders, some commenters addressed whether cylinders should be placed at certain additional locations around the school bus.

Several commenters, including the National PTA, Blue Bird, Mirror Lite, the West Virginia Department of Education (West Virginia), NSTA, Washington State, and Arizona, stated that a view down the left side of the bus was important. No commenter stated that a view of the left side of the bus was unnecessary. Mirror Lite cited fatalities in Michigan and Texas to support the view that incidents along the bus's left side, although uncommon, do occur. In recommending that the field-of-view be the same for both sides of the bus, Mirror Lite commented that the cost of such a requirement would be the same and that drivers prefer mirrors to be matching on the right and left, rather than having two different fields-of-view.

After reviewing the comments, NHTSA has concluded that the field-of-view on the left side of the bus should be extended back to the ground near the left rear wheel. While the agency acknowledges that children are infrequently struck near the left side of the bus, the agency notes that such incidents do occur. Accordingly, by requiring test cylinders to be placed by the left rear tire, the amendments will increase the likelihood that the new school bus mirror requirements can prevent these incidents as well.

The agency conducted mirror evaluations on both conventional and transit-style school buses indicating that left side mirror systems designed to meet the proposed field-of-view requirements for the left front corner and the front of the school bus would also be able to provide a view of test cylinders located at least six feet to the left of the left rear wheel without any adjustments to the mirrors. Additionally, based on the agency's review of current mirror systems, the agency anticipates that the mirrors on the left and right side of the bus will be symmetrical (i.e., a mirror designed to view the right side of the bus will also be able to view the left side of the bus when mounted on the left front of the bus). Based on the above, the agency has modified the final requirements to include additional test cylinders located one foot and six feet to the left of the left rear axle.

Although a cylinder located twelve feet to the right of the rear axle on the bus' right side is required to be visible, NHTSA believes that is not necessary to require that a test cylinder located twelve feet to the left of the rear axle be visible. For a school bus on the side of the road in a loading zone, a cylinder located twelve feet to the left of the left side of the bus would represent a student standing a full traffic lane from the bus. The agency believes that it is unlikely that a student would be in such a position when the school bus starts to depart from the loading zone. In localities where school buses stop in a traffic lane, a cylinder located twelve feet from the left side would represent a child on the other side of the street on a two lane street.

During the course of its mirror evaluations, the agency observed that, in some cases, the cylinders at the left rear axle of the school bus were either partially or fully blocked from view by the extended stop signal arm. Visibility depended on the bus body type and the location of the stop signal and the left side cross view mirror. In contrast, the test cylinders were visible when the stop arm was retracted. The agency also noted that the test cylinders at the right rear axle were either partially or fully blocked by the door when an outward-opening front entry door was open. Based on these observations, NHTSA has decided that the test procedure will specify that the stop signal arm be in the retracted position and the front entry door be closed. This procedure recognizes that school bus drivers must close the door, which retracts the stop signal arm, and then view the mirrors to ensure that no students are in danger around the bus before the school bus leaves the loading zone. If the driver attempted to view the areas around the bus before closing the door and retracting the stop signal arm the stop signal arm would also block the driver's view of the road, thus impairing many driving decisions.

Blue Bird commented that placing test cylinders J, K, and L on a plane one foot away from the bus would be more appropriate than the proposed two foot distance because the two foot location of cylinder L would provide only limited visibility adjacent to the rear wheel. (The agency notes that cylinder L in the NPRM is cylinder N in the final rule.) Blue Bird commented further that a one foot distance from the most outboard edge of the front bumper for cylinders J and K would help ensure adequate visibility near the front wheels. The agency agrees with this comment and has revised the location requirements accordingly.

Blue Bird commented that there were no proposed requirements for the visibility of cylinder M, which is located six feet from the right side of the bus at the rear wheel. (The agency notes that cylinder M in the NPRM is cylinder O in the final rule.) That was an oversight in the NPRM, and a provision about cylinder M is included in the final rule's requirements for mirror System B.

NSTA suggested that a test cylinder be added to the area directly to the rear of the service door. After conducting mirror evaluations, the agency has concluded that locating a test cylinder to the rear of the service entry door would not be necessary since mirror systems that provide a view of cylinders K and L would also provide a view of the rear side of the service entry door.

Transport Canada believed that because it is theoretically possible for blind spots to exist in some areas between cylinders in front of the bus, NHTSA should specify areas whose perimeters would be defined in terms of cylinder locations that must be seen, rather than simply the cylinders themselves. In the course of this rulemaking, agency staff have evaluated a variety of mirror systems on both conventional and transit-style school buses. In all cases where the test cylinders could be seen and identified in a mirror system, the full ground areas around and between the cylinders could be seen. The agency notes that while a blind spot could occur when looking at a single mirror, such blind spots were eliminated when viewing the entire mirror system. Although it might be theoretically possible for a blind spot to exist between test cylinders, the agency believes such situations would be extremely rare.

The New York State Senate Committee on Transportation (New York) believed that the requirements in

S9.2 for the System A driving mirrors on the right side of the bus should have a field-of-view that extends twelve feet out from the side of the bus, not just two feet out, to provide the driver with adequate warning time that a pedestrian contact is imminent. The agency notes that the requirements in S9.2 are primarily for the driving mirror system which must include at least one mirror of unit magnification. Such a mirror could not be adjusted to provide a view that included the side of the bus and a point twelve feet out from the rear axle line unless it were unusually large in size. Yet, such a large mirror would create its own large blind spot. The requirements for System B convex cross view mirrors, which are pedestrian detection mirrors, already provide the seated driver with information about individuals that may be as close as twelve feet from the side of the school bus. Accordingly, because the mirror that would be necessary to accommodate New York's request would have safety trade-offs and provide redundant performance, NHTSA has decided not to change the proposed requirements for S9.2 in this rule.

2. Cylinder Dimensions

The proposed provisions about the test cylinders used to represent student pedestrians specify that they be one foot high and one foot in diameter and require that their entire top surface be visible. The agency based this proposal on the VRTC report's recommendation that measurements be made near ground level and on accounts in the docket explaining that children struck by school buses were low to the ground. Additionally, narratives in the 1989 NAS report and the mirror requirements from Ohio support the concept of using some sort of three-dimensional representation of a small child. An exception to the one foot requirement would be that the cylinder placed twelve feet to the right of the rear right wheel, would be three feet high and one foot in diameter. The agency believed that this cylinder needed to have such dimensions to evaluate elongation.

Several commenters, including NSTA, Mirror Lite, and Thomas Built, supported the proposal to require the driver to view the cylinder's entire top. NSTA commented that this requirement would help ensure that the driver is provided with a complete enough image to enable the driver to identify student pedestrians in the mirror. After evaluating new generation mirrors and some older mirrors which they consider to be "marginal," Thomas Built determined that only the new mirrors could meet the cylinder viewing requirements. This led Thomas Built to conclude that viewing the top of the cylinders is a satisfactory requirement.

A few commenters were concerned that the proposed test cylinder was not adequate for ensuring that all of the critical areas of the ground would be visible. Washington State believed that by focusing on the cylinder's top, the proposed visibility test may be inadequate because it ignores contact at the ground level. Lo-Mar and Blue Bird believed that the view of the ground is not ensured through the use of one foot high cylinders. Accordingly, these commenters recommended that cylinders be replaced with one foot diameter flat discs.

After considering the comments about test object's dimensions, NHTSA has concluded that one foot tall cylinders better represent real-world situations than flat discs. In the majority of loading zone incidents, children struck and killed by school buses were either standing or bending over, according to the Kansas Department of Transportation's "1989 School Bus Loading & Unloading Survey." Therefore, the agency believes that most students who are struck by a school bus are at least one foot above the ground. Even children who have fallen are above ground level because their body thickness at their head or torso is at least six inches. If children have fallen, the agency expects that they will be attempting to get back up, which also adds height. The agency's mirror system evaluations further indicate that a three dimensional object such as the one foot tall test cylinder more accurately represents real-world situations than a flat disc. In addition, the cylinder facilitates testing by providing a more practicable means for demonstrating the ability of mirrors to view areas around the outside of the bus. The three dimensional cylinder also makes the relative image quality easier to ascertain.

Mirror Lite commented that the cylinders should be of a readily available design to facilitate testing and to avoid discouraging manufacturers from conducting the test. This view led Mirror Lite to recommend using bright orange 18" traffic cones. Washington State requested that along with establishing a requirement for the manufacture of new buses and equipment, the standard should also provide an ongoing performance standard for the end user (e.g., mechanics and bus drivers). Similarly, Ann Arundel County (Maryland) Public Schools explained that they were interested in incorporating the test cylinder grid into its training program.

As for Mirror Lite's comment about an 18" traffic cone, NHTSA believes that such a device is too tall to represent a child who may be bending over or has fallen down. The agency nevertheless agrees with Mirror Lite that having a readily available test object will assist States and local school districts in evaluating mirrors and training school bus drivers. The agency believes that the one foot cylinder is a reasonable size and shape that should be easy to obtain or fabricate. The agency also notes that the one foot test cylinder is only required for compliance test purposes, and that anyone desiring to build a test lane can substitute another test object when conducting evaluations or training.

While generally supporting the performance requirements for mirror System B, Blue Bird recommended an alternative requirement which defined the bounds of specific geometric areas on the ground outside the school bus which would have to be seen. Among Blue Bird's criticisms of the proposal were the use of a cylinder rather than a disc, the need to reduce the distance between the test cylinders and the bus to one foot, the need to include cylinder M in the performance requirements, and the need to include visibility requirements for the left side of the bus. Since all of these items have been addressed above and all but the use of a disc were adopted, the agency does not believe Blue Bird's recommended alternative is necessary.

3. Cylinder Color

The NPRM proposed that the test cylinders be a color which provides a high contrast with the surface on which the bus is parked. According to the VRTC report, such a contrast would facilitate compliance testing. While the proposal did not specify a particular color, the agency requested comments about what color would provide a high contrast with the ground and whether a given color should be specified.

Several commenters addressed the appropriate color and design of the test objects. NSTA suggested that rather than having a high contrast color, the cylinder should be a color that blends into the surroundings, believing that visibility becomes a problem when a child blends in with the surroundings (e.g., the bus itself, pavement). New York favored replacing the cylinders with two dimensional cutouts of children and adults with colors that are representative of clothes typically used by school children or adults.

Other commenters believed that the test cylinder should be a bright color. Mirror Lite recommended using bright orange traffic cones. Thomas Built explained that its mirror tests are conducted using bright colored cylinders, e.g., safety orange sides with lime green tops and black letters. R&R Research recommended that to make the test procedure less vague, the color of the test cylinders should "be specified either quantitatively (i.e., the percent contrast) or qualitatively by specifying the color of the cylinders."

After reviewing the comments and its own mirror evaluations, NHTSA has decided that the test cylinder must provide a high contrast with the surface on which the bus is parked. The agency believes that having such a high contrast will facilitate compliance testing. Nevertheless, the agency has determined that it would be inappropriate and unnecessary to specify a given color for the test cylinder. The agency has no information to suggest that one color would be more appropriate for a test cylinder than any other color. The agency believes that specifying a single color would complicate the standard without providing any significant corresponding benefits.

D. School Bus Mirror Systems

1. General

Standard No. 111 currently requires school buses to be equipped with two types of mirror systems: (1) An outside rearview mirror of unit magnification ("flat mirror") of not less than 50 square inches of reflective surface on each side of the bus; and (2) one convex cross view mirror. In practice, buses are equipped with a flat driving mirror on each side of the bus, two or more convex cross view mirrors, and typically at least one supplemental convex mirror mounted near each flat mirror and designed to serve as an additional driving mirror. Convex driving mirrors are typically about four inches in diameter and have a radius of curvature (ROC) greater than 35 inches. These larger radii of curvature mirrors have much greater image clarity than the convex cross view mirrors mounted on the front of the bus and therefore can safely be used as driving mirrors. All mirror systems are used by drivers to see students in the loading zone around buses, although the flat mirrors and the supplemental convex driving mirrors are primarily designed to serve as driving mirrors.

The NPRM proposed to modify the current requirements for both types of mirror systems so that each school bus would be equipped with two mirror systems on each side of the bus: (1) A system that includes flat driving mirrors of unit magnification and optional convex driving mirrors (designated as "System A") and (2) a system that consists of convex cross view mirrors for student detection during loading and unloading (designated as "System B"). The areas viewable along both sides of the bus via the two mirror systems would be required to overlap on each side, providing the driver with a view of the ground in front of and along both sides of the bus and extending at least 200 feet rearward from the driving mirror. Because the agency recognized that most current driving mirror systems on school buses consist of both a flat mirror and a convex mirror, the NPRM included language that "one or more mirrors" could be used to meet the requirements of S9.2 for System A mirrors.

2. Driving Mirrors—System A Mirrors

As for System A mirrors, the NPRM proposed making the current requirements for such mirror systems more objective and expanding the field-of-view to include a larger area. Specifically, the NPRM proposed amending section S9.2 to require that the driver have a view at least 200 feet to the rear and at least two feet to the right of the right side of the bus. The NPRM explained that the proposed requirements reflect the findings of the 11th National Conference on School Transportation and accounts in the NAS report and docket that a significant number of incidents occur by the right rear wheels of school buses.

In responding to the NPRM's proposal about System A mirror systems, several commenters, including Mirror Lite, Thomas Built, Transport Canada, and Blue Bird, appear to have misunderstood the proposed requirements of S9.2. Based on their comments, it appears that they believe the system's flat mirror portion by itself would have to comply with the requirement that the view of the "area of the ground which extends rearward from the mirror surface [must be] not less than 200 feet." The agency wishes to clarify that the flat mirror by itself need not comply with S9.2. The proposed requirements were for a "mirror *system*" (emphasis added) which could include both a flat mirror and a convex mirror. Accordingly, to comply with S9.2, it is permissible for the convex portion of the mirror system to provide some portions of the required field-of-view.

The agency believes that it is unnecessary to expressly require the installation of a convex mirror for the driving mirror system. Since the proposed revisions to Standard No. 111 are performance-oriented, not design-oriented, manufacturers can choose whatever mirror system they believe is best. Avoiding unnecessary restrictions facilitates the introduction of future technological improvements in mirror systems.

Blue Bird suggested modifying S9.2(c) by establishing specified zones along both sides of the bus which would have to be viewable to the seated driver. As explained in the section on test cylinders, the agency believes that establishing field-of-view requirements through test cylinders at specific locations around a school bus provides a more realistic simulation of real-world school bus operations than establishing geometric zones.

Blue Bird also commented that establishing minimum permissible radii for convex mirrors used in proposed mirror System A could be detrimental to the performance requirements being proposed. The agency notes that neither the NPRM nor the final rule included provisions about minimum radii of curvature for System A mirrors. The same is true for System B mirrors.

3. Convex cross view mirrors—System B Mirrors

a. *General.* S9.2(a) of Standard No. 111 currently contains detailed specifications about the characteristics of convex cross view mirrors, including minimum and maximum permissible radii of curvature, minimum surface areas, and restrictions for convex mirrors with non-uniform radii. The current standard only requires one convex cross view mirror.

The NPRM proposed that a cross view mirror system (System B) be provided on both sides of a school bus to ensure that seated drivers have a complete view of all critical areas in front of and along both sides of the bus that are not within their direct field-of-view. The NPRM also included a requirement that "[T]he view of the ground provided at the driver's eye location by system B shall overlap with the view of the ground provided by system A." The agency proposed to delete the current specifications for convex mirrors, believing that this action would permit States and local school districts to use a wider variety of mirrors.

The NPRM addressed several subissues about convex cross view mirror characteristics, including accommodation distance (i.e., the distance at which people can focus on images in mirrors), discontinuities in the mirror surface's slope, adjustment,

informational labeling, and image quality.

In addition to general questions about convex cross view mirrors, the agency specifically asked about whether a minimum permissible radius of curvature should be specified, whether convex cross view mirrors should be used for driving purposes, and whether the upper portion of convex mirrors should be cut off or blackened out to reduce the amount of glare reflected into the driver's eye.

All commenters supported using convex cross view mirrors to view areas outside of school buses. Commenters also addressed specific points about particular mirror systems. Mirror Lite believed that wide-angle cross view mirrors are better than multiple conventional mirrors because having multiple mirrors would result in confusion as to which mirror is showing what image.

Several commenters, including Thomas Built and Blue Bird, stated that in practice, convex cross view mirrors are used for driving purposes. Thomas Built and Blue Bird commented that certain convex cross view mirrors should not be used as driving mirrors. These comments are addressed later in this preamble in the section discussing an instructional message for the proper use of convex cross view mirrors.

Several commenters responded to the agency's question in the NPRM about cutting off or blackening out the cross view mirror's upper portion. The Arizona DOT opposed cutting off or blackening out any portion of the convex cross view mirror, believing that all portions of the mirror provide some benefit if properly adjusted and used. In contrast, Washington State, the Tennessee DOE, Florida, the Sloan Company, and Mirror Lite believed that the top portions of convex cross view mirrors serve no useful purpose and should be eliminated. Mirror Lite stated that the "market place has determined the upper portion of the mirror is of no value and may be a distraction to the driver."

Notwithstanding the comments favoring the elimination of the top portion of convex cross view mirrors, NHTSA believes that there is no conclusive information to support this approach. Additionally, there is no information available for determining what specific areas of mirrors should be cut off or blackened out. This type of requirement would also make the standard more design restrictive than the agency believes is desirable. In addition, Mirror Lite's claim that the "marketplace" has determined the need for blackening out such mirrors does not appear to be accurate, since several convex mirrors without blacked-out areas are apparently being successfully sold in the marketplace. However, if certain mirror areas are found to be inefficient, then the agency anticipates that the marketplace will make judgments on the efficacy of various mirror systems and that those judgments will be reflected in future mirror designs. Since no information was produced to suggest that the upper portions of cross view mirrors were dangerous to a driver's view of pedestrians, the agency has decided not to establish limitations on the field-of-view coverage provided by a cross view mirror. The agency believes that individual State and local school districts are capable of evaluating mirror systems that meet these standards and selecting those which best meet their needs, including, if they so chose, mirrors from which the top portions have been eliminated.

b. *Accommodation distances.* The NPRM proposed a new provision that would require that the distance from the center of each convex cross view mirror to the center point of the driver's eye location, plus one-half the smallest radius of curvature of the mirror surface be at least 39 inches. The agency based this proposal on the VRTC report's finding about accommodation distances, i.e., the finding that older people have greater difficulty focusing on nearby objects, especially in convex mirrors with small radii of curvature. According to the VRTC report, if the distance between the driver and the image in the mirror is less than 40 inches, drivers over 40 years old may see a blurred image.

Several commenters supported the 39 inch accommodation distance, believing that such a requirement is feasible. Thomas Built, R & R Research, and Mirror Lite stated that the 39 inch distance between the driver seat to the mirror is acceptable for most currently-produced buses. Nevertheless, R & R Research, along with NSTA, questioned whether transit type school buses could be equipped to comply with the 39 inch requirement. Neither NSTA nor R & R Research provided any specific information to support their concerns about transit buses.

Blue Bird disagreed with the 39 inch requirement, stating that it would be difficult to measure accurately and might hinder mirror performance and innovations. Blue Bird opposed having restrictions on the mirror's location, claiming that the agency does not restrict the locations of other bus components such as gauges, switches, and lights.

Based on the available information, including the agency's evaluations of the comments and various mirror systems, NHTSA has decided to adopt the proposed accommodation distance requirement with certain modifications. In evaluating various mirror systems on both conventional and transit-style school buses, NHTSA has found that these mirrors are always capable of complying with the proposed 39 inch requirement of S9.3(b)(2) when mounted at locations consistent with the mirror manufacturers' recommendation. The agency also notes that the concerns expressed by NHTSA and R&R Research about transit-style school buses not being able to meet such a requirement were not shared by the school bus and mirror manufacturers commenting on this issue, all of whom stated that the requirement could be met. Blue Bird did not claim that the proposed 39 inch requirement could not be met, only that it would be difficult to measure accurately. Also, Blue Bird appears to disagree with the proposed requirement on a philosophical basis, i.e., since NHTSA does not establish restrictions on the location of other components of the bus used during its operation.

In evaluating the proposal, NHTSA has measured the distances from the driver's eye location to the mirror surface on a number of school buses, including transit style buses, and has found it to be a straight-forward task that gets easier the more it is done. The aspect of the measurement that required the most effort was establishing the line of sight through a window and then measuring that line. The use of standard tape measures, one used to measure the distance from the mirror to the window and the other to measure the distance from the window to the eye location, worked well for establishing the line of sight and measuring it. The thickness of the window was then added to the measured distances. A more elaborate test setup could be established using a laser or high intensity light beam to establish the line of sight. Based on the agency's experience in measuring mirror distances, the degree of accuracy is not that critical since all of the mirror distances were well over 39 inches.

However, NHTSA agrees with the commenters that determining the minimum radius of curvature of a mirror may be a difficult and time consuming task. Accordingly, the agency has modified the final requirement so that the eye accommodation distance is based solely on the distance from the driver's eye location to the mirror surface.

The proposed requirements in S9.3(b)(2) have been modified to read as follows in this final rule: "Each mirror shall be located such that the distance from the center point of the eye location of a 25th percentile adult female to the center of the mirror surface shall be at least 37.5 inches." To repeat, the proposed requirement was for the distance from the center of each convex cross view mirror to the center point of the driver's eye, plus one-half the smallest radius of curvature of the mirror surface, to be at least 39 inches. While the proposal's provision about adding "one-half the smallest radius of curvature" to the distance from the driver's eye to the center of the mirror is no longer expressly part of the specified measurement, the agency derived the 37.5 inch distance in this final rule using the proposed combination of distance between the driver's eye and the mirror and one-half the radius of curvature of the mirror.

The 37.5 inch minimum was derived as follows. Of all the mirrors used in the VRTC report, the smallest radius of curvature (and thus the one with the poorest image quality) was 3.41 inches. Assuming that the design radius of curvature of future mirrors would not be less than 3 inches, then one-half of that radius of curvature would be 1.5 inches. Subtracting 1.5 inches from the 39 inch proposed requirement leaves 37.5 inches. The final rule accordingly accounts for accommodation distances in worst case situations, just as the proposal did, but simplifies the calculation.

NHTSA disagrees with Blue Bird's comment that mirror location should not be regulated because the location of other components (i.e., gauges, switches, and lights) in the bus are not regulated. The agency believes that to ensure the safety of student pedestrians, the images in school bus mirrors, particularly convex mirrors, cannot be blurred for any driver. That same level of concern is not necessary for clearly seeing a gauge or switch, since seeing such devices is not as critical for student safety as viewing a mirror system. Also the inherent nature of convex mirrors, which reduce the size and elongate the image of the reflected object, make mirror images more difficult to see and use. By contrast, the task of identifying gauges and switches is comparatively straightforward.

Arizona DOT commented that school buses should be equipped with forward mount driving mirrors on the left side, in lieu of the low mount driving mirrors currently being used by many districts. Arizona stated that this requirement "is needed in order for the mirror to be at least 39" from the driver's eye." NHTSA notes that Arizona appears to have misinterpreted the provision's applicability, because the minimum accommodation distance applies only to convex crossview (System B) mirrors, not to driving (System A) mirrors. Although the Arizona comment is related to driving mirrors, instead of the cross view mirrors, it illustrates that different cross view mirror mounting locations may be necessary on some types of school buses to meet the accommodation distance requirement.

c. *Discontinuities in a mirror surface's slope.* Standard No. 111 currently prohibits discontinuities in a mirror surface's slope. The NPRM proposed retaining this requirement, but redesignating it S9.3(b)(3). The proposal explained that prohibiting mirror discontinuities would prevent mirrors in which the slope or surface of the mirror was concave, thus protecting against poor image clarity.

All those commenting on this issue, i.e., NSTA, Mirror Lite, Thomas Built Buses, and New York State, agreed that retaining the current prohibition on mirror discontinuities is necessary. Accordingly, the final rule adopts this provision.

Mirror Lite suggested that the agency use the term "diminishing image" instead of "distortion" to describe the image quality provided by cross view mirrors. It stated that distortion is a flaw in the mirror surface that can be found in any type of mirror. After reviewing the comment, the agency agrees with Mirror Lite and has decided to use the phrase "image clarity" rather than "distortion" in the preamble. Nevertheless, the agency notes that this term is not in the regulatory test.

d. *Mirror supports and adjustment.* Standard No. 111 currently requires each flat mirror and each convex cross view mirror to be installed with a stable support. The NPRM proposed that each convex cross view mirror "be installed with a stable support designed to dampen vibration." This requirement is intended to ensure a clear and properly focused image by preventing mirrors from vibrating unreasonably and by reducing the likelihood that mirrors become misaligned. Comments to the ANPRM explained that such misalignment reduces a driver's ability to see children in potentially dangerous locations around a stopped school bus.

The NPRM asked the following questions about mirror stability:

(1) Could the requirements be made more precise?;

(2) Is is necessary to require adjustable mounting brackets for all types of cross view mirrors?; and

(3) Do non-adjustable brackets reduce the amount of vibration of the mirror while driving or idling?

Commenters disagreed about the need for requiring mirrors to have stable supports. NSTA and Thomas Built believed such requirements were not needed, with Thomas Built stating that most current mirror mounting systems provide a stable yet easily adjustable mirror system. In contrast, Washington State and Transport Canada supported the proposal to require stable supports. Transport Canada favored an objective test to evaluate the stability of mirror brackets for cross view mirrors but had no particular recommendations to increase the requirement's precision. Washington State supported the proposed regulatory language, agreeing that vibration can significantly harm image quality. Nevertheless, Washington State suggested that additional language be included stating that if a mirror adjustment mechanism is necessary, it should be designed so that vibrations would not misalign the mirror. Arizona explained that its draft State mirror requirements would specify that cross view mirrors "shall be easily adjustable but be rigidly braced to reduce vibration."

Commenters discussed the types of mirror adjustment mechanisms currently being used. Some mirror systems have both adjustable brackets and mirrors, some only have adjustable mirror portions, and others only have adjustable brackets. Mirror Lite, Flynn, and Sloan believed that mirrors should be adjustable. Tennessee, Arizona, and Blue Bird believed that mirrors should have adjustable brackets. Blue Bird commented that properly tightened adjustable brackets become rigid and thus perform the same function as non-adjustable brackets.

After considering the commenters' varying views, NHTSA has determined that Standard No. 111's existing requirements for mirror stability are appropriate, and they are adopted in this rule. The agency recognizes that different mirror manufacturers have developed various types of mounting brackets and mirror mountings that employ different degrees of adjustability or non-adjustability. There is no evidence in the comments to the docket, or in any of the mirror evaluations the agency has conducted, that the proposed requirements could be made any more precise. NHTSA notes that Standard No. 111 currently requires "stable support" for both inside and outside mirrors on all types of vehicles, not just school buses. The agency believes that these requirements should be retained for school buses. While a

more precise requirement is not possible, the agency believes it is important to retain a requirement for mirror stability in the standard as a means of highlighting the importance of mirror stability to mirror performance.

One change from the proposal is prompted by Transport Canada's comment that the stability requirements should also apply to the System A mirrors. As Transport Canada stated, Standard No. 111's existing requirements for school bus outside rearview mirrors include "stable supports." The agency agrees that the stability requirements should continue to apply to System A mirrors, and the final rule's requirements have been modified accordingly.

Additionally, NHTSA notes that on April 26, 1991, it revised Guideline #17 to state "that all school buses shall have a system of mirrors that conforms to the school bus requirements of FMVSS No. 111." (56 FR 19270) While this amendment means that the most current requirements in Standard No. 111 are applicable, the agency has decided to issue elsewhere in today's **Federal Register** a conforming amendment to clarify this situation. In particular, the conforming amendment deletes the outdated requirements referring to the 30 inch rod test in Guideline #17.

e. *Informational label on using cross view mirrors for driving purposes.* The NPRM discussed the agency's concern about using convex cross view mirrors as driving mirrors. These concerns were based on the agency's belief that the inherently poor image clarity and image size reduction characteristics of highly convex mirrors make such mirrors inappropriate for driving purposes. In addition, the reaction time is slower for drivers using several mirror systems each with significantly different radii of curvature. Such mirrors may not provide the driver with a consistent reference point with respect to the location of images in the various mirrors. Accordingly, the NPRM proposed that mirrors with an average radius of curvature less than 35 inches be marked with the following message:

"THIS MIRROR IS NOT DESIGNED FOR USE WHILE THE VEHICLE IS IN MOTION."

The NPRM identified three issues about these informational requirements: (1) The need for such a message; (2) the message's content; and (3) the message's location. As to location, the agency proposed that the message be placed directly on the mirror, but requested comments about other possible locations.

Regarding the need for an informational message on convex cross view mirrors, only NSTA and Thomas Built Buses believed that a message was unnecessary. NSTA stated that the message could impair the mirror's effectiveness and distract the driver. NSTA and Thomas Built said that the message was unnecessary because they believed that driver training would be more effective than a label whose benefits were questionable.

All other commenters supported having an informational label either expressly (Mirror Lite, R&R Research, Washington State, and Sloan Company) or implicitly (Transport Canada, Anne Arundel County Schools, New York State, Tennessee DOE, Arizona DOT, Lo-Mar, and Blue Bird) by not objecting to the label, while commenting on the location, size, or wording of the warning. R&R Research stated that an informational label was necessary because in practice drivers use cross view mirror systems to gain information on traffic conditions around the bus.

After considering the comments, NHTSA has determined that a message explaining the proper use of convex cross view mirrors is necessary since some drivers use these mirrors for driving purposes. The agency is aware that properly trained drivers will have been taught that these mirrors are for pedestrian detection purposes only. Accordingly, NHTSA believes that the label will serve more as a reminder message rather than as an "instructional" message for those drivers trained in the proper operation of school buses and use of mirror systems. The agency believes that the message will also benefit untrained drivers, by informing them about the mirror system's proper use.

As to the content of the message, R&R Research commented that the label should communicate two things: the correct action required of drivers, and the potential consequences of inappropriate behavior. NHTSA agrees with R&R's comment that a more positive, informative message would provide greater potential safety benefits than the proposed one. Specifically, the message adopted in the final rule explains what action should be taken (i.e., use the mirror to detect pedestrians), what action should not be taken (i.e., do not use the mirror to view traffic), and why the mirror should not be used inappropriately (i.e., the images do not accurately show another vehicle's location). Accordingly, the message required by the final rule has been changed to read as follows:

"USE CROSS VIEW MIRRORS TO VIEW PEDESTRIANS WHILE BUS IS STOPPED. DO NOT USE THESE MIRRORS TO VIEW TRAFFIC WHILE BUS IS MOVING. IMAGES IN SUCH MIRRORS DO NOT ACCURATELY SHOW ANOTHER VEHICLE'S LOCATION."

Many commenters addressed the proper location for an informational message about cross view mirrors. Only Anne Arundel County favored placing the message on the mirror itself, claiming that placing this message elsewhere inside or outside the bus would create problems since many buses already are required to contain several messages.

All other commenters, including R&R Research, New York State, Lo-Mar, Arizona DOT, Tennessee DOE, Transport Canada, Washington State, and Mirror Lite, recommended that the message be placed inside the school bus near the driver instead of on the cross view mirror itself. Commenters stated that a message placed directly on the mirror would be difficult to read and would obstruct some images, thus adversely affecting mirror performance. Tennessee DOE stated that the message should be placed on or near the instrument panel. New York State favored including the message on a sticker attached to the bus in the line of sight of the driver when observing the mirror. R&R Research favored placing the message inside the bus either on the instrument panel or near the interior rear view mirror.

After considering the above comments, NHTAS has decided that the message should be located inside the school bus near the bus driver instead of on the convex cross view mirror. The agency agrees with the comments that a message placed directly on the mirror would be difficult to see and would reduce mirror performance by obscuring some mirror images. As noted above, the agency's primary goal is for drivers to understand that these mirrors should not be used while the vehicle is in motion because information obtained in such situations is not accurate enough to make appropriate driving decisions.

The agency agrees with Anne Arundel County that the driver's area already contains a number of informational labels explaining proper school bus operations. Since the agency is unaware of any single "best" location for the mirror-use label, the final rule provides flexibility to bus manufacturers in placing the label at an appropriate location which is prominent and visible within the driver's area of the bus. The standard requires the label to be printed in type face and color that are clear and conspicuous. NHTSA notes that these locations, size, and color requirements are patterned after the warning label requirements for utility vehicles in 49 CFR 575.105.

f. *Performance requirements for image clarity.* The NPRM proposed performance requirements to ensure that the images in cross view mirrors were of sufficient minimum quality to provide the school bus driver with reliable information about the presence of children in front of and along both sides of the bus. In selecting these proposed requirements, the agency relied on the VRTC report's finding that only a limited level of image quality is necessary to ensure that a school bus driver is aware of a student in a dangerous zone, so as not to move the bus until the student has moved to a safe location.

The NPRM proposed two requirements to ensure adequate image quality. First, the separation between the edge of each cylinder's image and the edge of the effective mirror surface would have to be not less than 3.0 minutes of arc. This requirement stems from the agency's finding that the most difficult images to recognize are elongated ones near the mirror's curved reflective edge. Second, with respect to the image of the cylinder perpendicular to and twelve feet away from the rear right axle, the angular size of the longest dimension of that image would have to be not less than nine minutes of arc and the angular size of its shortest dimension would have to be not less than three minutes of arc. This requirement stems from the agency's finding that unreasonable elongation would make it difficult for the driver to identify a child's image in the mirror.

Several commenters addressed the issue of image quality. Mirror Lite believed that a test procedure was necessary to reduce distortion due to a flawed mirror surface and to increase image quality. NSTA stated that only a reasonable level of image quality is necessary, since a driver needs only to recognize that an object in the mirror is a child and does not need to know specific details about the image. Thomas Built commented that the specification for the minimum distance between the image and the mirror's effective edge could be eliminated, believing that the elongation requirements of S9.4(b) (1) and (2) should make the image "acceptable."

Commenters also provided general comments about the image quality requirements. Transport Canada stated that when a cylinder is visible in two mirrors, both images should have to meet the requirements for minimum size and distance from the mirror's edge, believing that this would ensure that a small child would not be overlooked. While Blue Bird agreed that the location of the image relative to the outer edge of the mirror surface should be limited, it believed that the proposed requirement of three minutes of arc would be difficult to measure given its dependence on the following variables: (1) The radius of effective mirror surface, (2) mirror adjustment by the driver, and (3) distance from the driver's eye location to the image in the mirror for different mirror combinations and bus types on which mirrors are mounted. Blue Bird was concerned that this proposal would result in ambiguities given potential problems in accurately measuring the allowed mirror distance between the image and edge of the mirror. Blue Bird recommended establishing a limit on the distance between images and the mirror edge which it characterized as being more easily measurable during compliance testing.

Several commenters provided specific suggestions about changing the requirements for image quality. Thomas Built recommended that each cylinder's top surface have a letter which would be used to evaluate image clarity. Thomas Built believed that the proposed three minutes of arc was "minute and undeterminate," stating that on a mirror with a 28 inch radius of curvature, three minutes of arc is only .024 inches. Accordingly, Thomas Built suggested the requirement be eliminated unless a fixed dimension such as ¼ inch is specified. Similarly, Blue Bird suggested establishing a fixed distance of 1/16 inch along the effective mirror surface's edge to be blocked out during compliance testing.

After reviewing the comments, NHTSA repeated several mirror evaluations and created charts representing a distance of three and nine minutes of arc for use in the proposed test procedure. (See Figure 4.) Based on that evaluation's results, the agency believes that three minutes of arc can be accurately measured and that this dimension provides adequate separation between the test cylinders and the effective edge of the mirror. Accordingly, the final rule adopts the proposed three minutes of arc requirement.

As for Thomas Built's suggestion to letter the tops of the cylinders, NHTSA notes that the VRTC report found that such precision is not necessary for the driver to recognize that a pedestrian is in danger. In addition, such a high level of precision might be impracticable for certain mirrors that nonetheless provide an adequate field-of-view. Similarly, the agency believes that adopting Transport Canada's recommendation for multiple images of the same cylinder to comply with the image clarity requirements would be unnecessary for safety and would be redundant. Moreover, such a requirement appears to be impracticable based on the agency's evaluation of various mirror systems.

As for the suggestions by Thomas Built and Blue Bird to establish a minimum fixed dimension of either 1/16 or ¼ inch between the test cylinder image and the mirror's effective edge, NHTSA believes such an approach would be neither practicable nor appropriate. NHTSA notes that the "effective edge" of a convex mirror varies depending on the adjustment of the mirror and the driver's eye location. Accordingly, it is not feasible to specify a measurement from a variable location since the effective edge of a convex cross view mirror is often towards the center of the mirror, instead of at the actual edge of the mirror.

g. *Image elongation.* As noted above, the NPRM proposed language controlling the minimum angular size of the image of the test cylinder located twelve feet perpendicular to the side of the bus at the right rear axle line. The purpose of this proposal was to ensure that the image would not appear unreasonably elongated, a phenomenon that might prevent drivers from being able to identify a child's image in the mirror. As noted in the VRTC report and in the agency's in-house evaluation, drivers have the most difficulty seeing images of objects along the axis perpendicular to the right rear wheel because some current designs of convex cross view mirrors unreasonably elongate the image.

Several commenters expressed their views about the elongation requirement. R&R Research stated that the proposed minimum image sizes of three minutes and nine minutes of arc would be adequate as a minimum standard for most situations. Nevertheless, it believed that occasionally a driver with poor vision in low contrast situations would not be able to detect objects in a mirror designed to comply with the proposed minimum image size requirements.

Blue Bird objected to the proposed elongation requirements, claiming not to understand the use of cylinder N to measure distortion. Blue Bird believed that the agency did not justify the specified angular dimensions for a distorted image viewed in any particular mirror, arguing that the proposed angular sizes may be too restrictive and may not correspond to real-world situations. In support of its argument, Blue Bird cited the VRTC report which stated that "It is better to have a 'distorted' object in the mirror than no object at all." Based on the above, Blue

Bird requested that the agency conduct additional research to determine practical real-world limits for allowable image distortion.

Commenters also offered specific recommendations about the performance requirements for elongation. R & R Research suggested that the final rule contain either a table of target dimensions that subtend the three and nine minute visual angles when viewed at a specified distance or contain the mathematical formulae to calculate them. Lo-Mar requested that "angular size" be better defined, claiming that the angular size of the cylinder's image in the mirror is confusing. Nevertheless, Lo-Mar offered no specific suggestions.

Transport Canada suggested that the image size requirements be extended to all cylinders in all mirrors, stating that cylinder N will not necessarily appear in the mirror at the mirror's smallest radius of curvature. Transport Canada also suggested that the minimum angular size for cylinders A through F be five minutes of arc, and the minimum angular size for cylinders G through K be ten minutes of arc.

After reviewing the comments and conducting additional mirror evaluations, NHTSA has decided to adopt the proposed requirements for minimum angular dimensions of test cylinder N in this final rule. The agency notes that the test cylinder identified as N in the NPRM is identified as cylinder P in this final rule. The agency believes that the elongation requirements are necessary to protect against poor image quality for objects toward the rear of the bus.

In response to the comments from Transport Canada, Lo-Mar, and Blue Bird, the agency notes that test cylinder P will most often be located further towards the edge of the effective mirror surface than the other test cylinders. Therefore, cylinder P's image will typically be a worst-case image that is subjected to more spherical aberration than other images that are further from the effective edge of the mirror. Because of this, the image of cylinder P will typically be the least clear. This fact, combined with test cylinder P being located the farthest away from the mirror and driver, indicates that controlling the image clarity of test cylinder P should effectively control the image clarity of all test cylinders.

NHTSA believes that the minimum angular sizes (three minutes and nine minutes) adopted here in the elongation requirements are consistent with the dimensions adopted in the image clarity requirements for the distance from test cylinders to the effective edge of the mirror (three minutes). Both sets of dimensions were based on NHTSA mirror evaluations and the capabilities of these existing mirrors to meet those dimensional limits. While real-world evidence to define conclusively the optimum image sizes is not available, and may be impossible to obtain because of the many factors influencing the clarity of an image in a cross view mirror, the agency believes the adopted image clarity and elongation requirements are reasonable and practicable. Aside from the objections by Blue Bird and Lo-Mar, no other comments were received on this subject. The agency assumes that the other commenters tacitly approved the image clarity and elongation requirements since the NPRM expressly asked about the reasonableness and practicability of these requirements, a subject about which the commenters are generally knowledgeable.

After reviewing R&R Research's comment about including a comparison chart and the mathematical formula, the agency has decided to modify the final rule to incorporate a size chart for three minutes and nine minutes of arc and the formulae for calculating them.

E. Testing procedures

1. General

Based on the VRTC report and other agency findings, the agency proposed in section S13 certain test procedures under which the proposed performance requirements would be evaluated. As explained below, the NPRM proposed detailed specifications about the characteristics of test cylinders and their placement at critical locations in front of and along both sides of the school bus. The NPRM also proposed a testing reference point and testing procedures, including the photographing of test cylinders.

2. Testing Reference Point 25th Percentile Female

The NPRM proposed that compliance testing be measured relative to the center point of the eye location of a 25th percentile adult female represented by a two dimensional manikin. The agency selected this sized driver because such a driver tends to have a poorer direct field-of-view of the area near the bus than a taller (e.g., 95th male percentile) driver.

The proposed regulatory text in S13.2 contained specific information on determining the eye location of a 25th percentile adult female seated in the driver's seat. These provisions concerned the seat's position and adjustment procedures.

Several commenters addressed the testing requirements related to the driver position. R & R Research believed that the standard need not refer to the 25th percentile female since precise dimensions from the seat are provided. Blue Bird disagreed with the use of a 25th percentile female for identifying the eye location, stating that for passenger cars, Standard No. 111 uses a driver's eye location corresponding to a 95th percentile male. Notwithstanding its criticisms, Blue Bird acknowledged that the proposed eye location procedures would allow precise determination of the driver's eye location in any bus. Transport Canada believed that multiple eye locations should be used in the test procedure, including a 5th percentile female and a 95th percentile male. It stated that the 95th percentile male provides the worst-case viewing in indirect field-of-view situations since that type of driver sits farthest from the mirrors.

After reviewing the comments, the agency continues to believe that the eye location of the 25th percentile adult female is appropriate for representing a "worst case" for visibility. Therefore, the proposed requirements are adopted in this final rule. The agency notes that because the adopted requirements consider the bus's entire field-of-view and not just the indirect view created by mirrors, the 25th percentile female provides a more stringent testing perspective than a 95th percentile male. This consideration outweighs the perceive benefits from having consistent reference points in Standard No. 111 for all the different types of vehicles.

The agency believes that Transport Canada's suggestion that eye locations be based on 95th percentile males and 5th percentile females would create excessive requirements. As discussed below in the section on "Camera Testing Points," the final rule allows for compliance within an area formed by the points of an arc located six inches to the left, forward, and right of the eye location of a 25th percentile adult female. Such a requirement recognizes that drivers typically move their heads while viewing mirrors, and that the range of these movements would encompass eye locations for various size drivers.

As R&R Research stated, the final rule provides dimensional information for locating the center point of the driver's eye location. Even though it may not be strictly necessary to do so, the agency believes that the rule should expressly state that the source of that dimensional information is the 25th percentile adult female.

3. Mirror Adjustment During Testing

The NPRM proposed that the mirrors be adjusted in accordance with the manufacturer's recommendations (see S13.3). Several commenters addressed the issue of mirror adjustment. R&R Researcher and Transport Canada stated that the agency should modify proposed S13.3 in the final rule to state that, once adjusted, the mirrors must remain fixed in one position throughout the measurement procedure. On the other hand, New York State commented that mirrors subject to Standard No. 111 should be remotely adjustable from the driver's seat to accommodate the eye locations of different size drivers.

After reviewing the comments, NHTSA has decided to modify the language in S13.3 to prohibit moving or adjusting mirrors during compliance testing. The agency's intention in the NPRM was to require mirrors that would, once properly adjusted, afford the driver a clear view of children present around stopped school buses. Mirrors that must be repeatedly adjusted to view the entire area around the stopped bus would not effectuate that intention. In addition, mirrors that must be repeatedly adjusted are not likely to be adjusted every time by the driver, which would mean there potentially could still be situations where the driver could not detect child pedestrians around the stopped school bus. To ensure that the mirrors required by this final rule will not need any further adjustments after the initial one, this rule modifies the proposed language in S13.3 to make such a requirement explicit.

This rule has not been modified in response to New York's comment about remotely adjustable mirrors. As explained above, the agency is seeking to require mirrors that will offer a clear view of the area around a stopped school bus without any further adjustments after the initial one. While remotely adjustable mirrors are now available, they will not be considered as complying with this rule if they must use their adjustability characteristics to provide the required view during testing.

4. Camera Testing Points

The NPRM proposed that observations would be made and photographs taken of the test cylinders from a point representing the center of the driver's eye location for a 25th percentile adult female, as well as at locations six inches forward, left, and right of the center of the driver's eye location. These multiple positions were intended to account for head movements. Under the proposed test procedures, cylinders that were directly viewable would be evaluated first, and then cylinders that were not directly viewable would be evaluated. In both situations, the evaluator would look through a camera's film plane to determine whether the entire top surface of a test cylinder could be directly seen. A comparison chart placed above each mirror would serve as a reference point in evaluating the image size and amount of distortion of cylinders visible in a mirror.

Many commenters addressed the requirements related to the camera locations. The Arizona DOT supported the proposed procedure. According to this commenter, it evaluated some existing mirror systems in accordance with the proposal and determined that the driver's eye location can be established and the camera location is correct.

Other commenters either criticized the proposed camera-related testing procedures or offered suggestions to improve the requirements. Mirror Lite was concerned that the camera location requirements would be interpreted differently by various bus manufacturers, but did not explain the basis for its concern. Thomas Built requested that mirror systems should only have to meet the test requirements from any one of the allowable camera locations instead of all locations, claiming that the time and cost of conducting photographic tests at multiple locations would be unreasonable. In support of its request, Thomas Built stated that the proposed requirement would require it to evaluate 140 bus/driver seat combinations for any given mirror system since certification testing would have to be conducted on each type of bus with each type of driver seat offered. Since Thomas Built estimated that evaluating one seat in one bus with one mirror system required about 80 man hours and $125 of photographic materials, it viewed the testing necessary to evaluate 140 combinations as being overly burdensome.

Blue Bird criticized using a camera to measure compliance, citing such concerns as the camera's monocular vision, the burden to customers of many photographs and their duplication for documentation purposes, the camera's inability to define correctly the direct field of view, and its inability to consider adjustments made by humans in mirror visibility.

Transport Canada requested that video cameras be allowed, claiming that their use would permit viewing of images superior to those seen by cameras. It also requested that the requirements provide more detail on the focal length of the camera lens.

After reviewing the comments, NHTSA agrees with Thomas Built that requiring testing at multiple points would be overly burdensome and would not yield significantly more worthwhile information. Upon reexamination, the agency now believes that a more appropriate procedure would be to allow testing to be done at any point within a specified area around the 25th percentile adult female driver's eye location. Such a procedure more accurately accounts for real-world situations in which drivers typically move their heads while they view mirror systems. Based on the above, the agency is changing S13.4 in this final rule to allow compliance with the standard at any one of the four points specified in Figure 3 (point "A," "B," "C," or "D") or at any single point within a semicircular area established by a 15.24 centimeter (6 inch) radius parallel to and forward of the center point. This viewing zone is illustrated in Figure 3. The agency anticipates that this modification will provide meaningful information about the driver's view of critical areas around the bus, while reducing the photographic time and cost factors mentioned by Thomas Built by 75 percent. The agency believes that if a vehicle manufacturer can establish compliance at one of the four testing points or any point in the semicircle, then that mirror system on that school bus should provide an adequate field-of view given the small size of the semicircle.

NHTSA believes that Blue Bird's concerns about a camera's monocular vision and its inability to define the direct field of view are philosophical in nature and relate to the inherent limitations of current technology. Given the available means to demonstrate objectively compliance with this standard, NHTSA is unaware of any other means that would be as effective, as practicable, and as easy to demonstrate as the use of a camera.

As for Mirror Lite's claim that the camera location specifications were ambiguous, the agency disagrees. NHTSA believes that difficulties in interpretation are unlikely, because the camera location specifications are well defined and easily achieved in actual testing situations.

As for Transport Canada's comment about video cameras, NHTSA has determined that this testing method is appropriate and should be permitted. Accordingly, the final rule at S13.4 has been modified. While video technology as a means for demonstrating

compliance with this standard may currently be less practicable than still photography, the agency believes that technological improvements may make video cameras a more viable option in the future. The agency therefore has decided not to preclude their use. To accommodate this modification, the term "film plane" has been changed to "image plane."

As for a lens focal length, the agency does not believe specifications about the focal length of lens are necessary. During the agency's mirror evaluations, lenses of various focal lengths were used to photograph the mirror images, including 50 mm to 250 mm lenses. While the ability to analyze the results was acceptable with all lenses, the agency noted that less enlargement was necessary when using a lens with a longer focal length. The agency believes it is reasonable to allow the entity conducting the test to select the type of camera and lens best suited to its purposes.

F. Miscellaneous Considerations

1. Certification

Thomas Built requested that the mirror manufacturer be responsible for certifying the image's quality and the bus manufacturer be responsible for certifying the field-of-view. It stated that this division of responsibility would simplify the testing and development process between mirror and bus manufacturer.

NHTSA notes that Thomas Built's suggested certification scheme would be inconsistent with the scheme set forth in Standard No. 111. That standard is a "vehicle" standard under which the vehicle manufacturer, and not the mirror manufacturer, is responsible for ensuring that a mirror complies with the standard. This ensures that vehicles equipped with noncomplying mirrors will be quickly remedied, without the need for a specific determination of whether the noncompliance arose because of an innate problem with the mirror or because of its installation on these particular vehicles. The agency does not believe there is any reason to change this scheme for school buses under Standard No. 111. Notwithstanding this conclusion, the agency notes that a vehicle manufacturer can establish in its purchase specifications whatever level of requirements it chooses for its suppliers and take appropriate actions if the supplier's products fail to conform to those specifications.

2. Retrofitting

Several commenters, including the National PTA and the National Education Association (NEA), advocated that NHTSA require existing school buses to be retrofitted to comply with the new requirements. The National PTA stated that the agency's decision not to retrofit existing school buses was "based more on a lack of regulatory courage than legal restrictions."

The agency's statutory authority under the National Traffic and Motor Vehicle Safety Act (the Safety Act; 15 U.S.C. 1381 *et seq.*) is to issue safety standards applicable to new motor vehicles and new items of motor vehicle equipment before their first consumer purchase. The Safety Act expressly provides that vehicles and items of equipment are not required to continue to comply with all applicable safety standards after their first purchase for purposes other than resale. See section 108(b)(1) of the Safety Act (15 U.S.C. 1397(b)(1)). Thus, NHTSA's safety standards regulate the manufacture and sale of new vehicles and items of motor vehicle equipment. Regardless of the agency's "regulatory courage," amendments to the safety standards do not and cannot require vehicles in service to comply with the requirements adopted in final rules.

However, the individual States do have the authority to regulate vehicles in service. Notwithstanding the lack of Federal authority to order school buses already in service to meet these amended requirements, the agency anticipates that many in-use school buses already comply with or will be retrofitted by State and local authorities to comply with these amended requirements.

3. Applying Requirements to Buses Other Than School Buses

New York State recommended the agency apply the new field-of-view requirements to all transit-type vehicles that transport the public.

NHTSA notes that New York's recommendation to apply the field-of-view requirements to non-school buses is beyond the scope of this rulemaking action, since the NPRM only proposed new requirements for school buses. The agency notes that the benefits of applying these requirements to transit buses appear questionable since most school bus-related incidents involve children under the age of seven. Notwithstanding the above discussion, the agency does not prohibit using "school bus" mirror systems on other types of buses.

4. Heated Mirrors

New York State and Moto Mirror requested that the agency require school buses to be equipped with heated mirrors, at least for those areas that experience cold weather.

NHTSA recognizes that some northern portions of the country experience weather conditions where mirror systems can become covered with ice and snow. While these conditions affect the potential effectiveness of the mirror systems, NHTSA believes that the responsibility for maintaining the mirror systems, and any part of the vehicle which affects the performance of the mirror systems, is best left with the State and local school districts. The agency further notes that since school buses are manufactured for use in all parts of the country, they must comply with all applicable standards. Therefore, it would be unreasonable to promulgate a national standard that would have little or no benefit for a significant part of the country.

5. Maximum Permissible Number of Mirrors

Several commenters addressed the number of mirrors with which a school bus should be equipped. R & R Research believed that the new standard should address the number of mirrors allowed on a school bus and the size of the mirrors. While the number of mirrors affect the time a driver needs to search visually the area around the bus, mirror size affects the blind spots created by the mirrors themselves. Transport Canada believed that the number of rear-view mirrors should be limited to one per side to avoid possible confusion produced by multiple images and reduce the total time drivers must divert their attention from the road ahead.

While NHTSA is aware of the situation mentioned by R & R Research and Transport Canada, no provision limiting the number of mirrors on school buses has been included in this final rule because the agency does not believe that there would be a safety benefit from such a limitation. The agency further notes that a major purpose for this rulemaking's field-of-view approach is to allow school bus users and manufacturers to determine the best mirror system for their particular operating environment.

6. Blind Spots

The NPRM requested comments about whether the mirrors would create dangerous blind spots in the driver's direct field-of-view, given the size and location of some convex cross view mirrors.

Several commenters believed that the agency should address the potential problems of blind spots created by mirrors. R & R Research believed that any new standard should address the mirror size, since this affects the blind spots created by the mirrors themselves. Transport Canada suggested that mirrors be located in areas that do not obstruct the driver's direct view of traffic and pedestrians. Thomas Built and a bus driver commented that while convex cross view mirrors do not create significant blind spots, side mounted driving mirrors may decrease visibility.

Other commenters believed that blind spots were not a significant safety problem Arizona DOT stated that the increased field-of-view provided by mirrors offsets the corresponding blind spots. Blue Bird stated that blind spots created by a cross view mirror on one side of the bus can be viewed in the cross view mirror system on the other side of the bus.

NHTSA agrees with Arizona DOT that blind spots in the direct field-of-view created by mirrors themselves are offset by the larger indirect field-of-view provided by the mirror system. Although NHTSA does not believe it is appropriate to establish requirements for mirror locations, the agency does believe that mirror and school bus manufacturers should strive to develop mirror locations which limit the amount of obstruction to the driver's direct field of view.

7. Glare from Mirrors

The NPRM asked whether glare from some cross view mirror designs, caused by turn signals and other school bus lights, would reflect light from flashing turn signals into the driver's eye.

Of those who commented on this issue (Thomas Built, Blue Bird, Arizona, Mirror Lite, Tennessee), no commenter believed that glare caused a significant safety problem. Based on the comments, the agency does not believe that reflected light or glare from convex mirrors presents an unreasonable safety risk to school bus drivers.

8. Non-Mirror Systems

The NPRM discussed the docket comments received about mechanical and electronic devices which could be used either to keep students away from critical areas around the school bus or to alert school bus drivers to the presence of someone in a critical area around the bus. The agency explained that mirrors offer the most effective means of providing the school bus driver with a complete view in front of and along both sides of the bus. The agency believed that requiring these additional non-mirror devices "would substantially increase compliance costs without significantly increasing safety benefits."

The Arizona DOT agreed that instead of requiring such devices, it would be more cost effective to evaluate their effectiveness through pilot programs. SCAN, the manufacturer of an electronic detection system, requested that the agency modify the field-of-view requirements to allow compliance through mirrors or sensing/detection devices. SCAN believed that the NPRM was unduly negative toward its type of product and requested that critical comments from Blue Bird and Thomas Built about non-mirror systems be stricken from the docket.

The agency continues to believe that, in terms of performance, reliability, and cost, mirrors offer the best means for school bus drivers to become aware of pedestrians in front of and along both sides of the bus. Accordingly, the agency does not agree with the SCAN's belief that sensing/detection devices should be allowed as a means of meeting the standard's field-of-view requirements. Notwithstanding this decision, sensing/detection devices may be used as supplementary devices on school buses.

G. Costs

In previous notices, NHTSA considered the rulemaking's expected cost. The ANPRM estimated that the unit cost for a System B convex cross view mirror with a bracket plus installation would range from $52 to $107. The NPRM explained that the costs of an additional convex cross view mirror would range from $58 for a four 8" (17" ROC) convex mirror system to $121 for an 8"x12" quadrispheric "Bus Boy" mirror system. The proposal noted that, since school bus manufacturers and users were free to choose what convex cross view mirror system they would use to comply with the performance requirements, those parties' choices would greatly affect the ultimate costs. However, the agency anticipated that the cost of complying with the proposed changes would be minimal because of the current State mirror specifications. For example, States that currently specify four 8" (17" ROC) convex mirrors on cross view tripods, at a cost of $58 00, could switch to a pair of elliptical mirrors which cost nearly the same—$58.10.

The NPRM requested comments about this proposal's cost to school bus users and information about current State requirements for school bus mirrors.

Several commenters, including States and school bus manufacturers, generally agreed with the NPRM's cost estimates. The Arizona DOT and Tennessee DOE commented that the NPRM's cost estimates were accurate. Mirror Lite commented that the parts cost (i.e., mirrors and mounting arms) of four currently used standard 8" mirrors on a conventional bus is $44; while, the cost of two Bus Boy mirrors and brackets would be $51, a $7 difference. While Mirror Lite did not provide a cost for installation, the agency believes that the installation cost for two Bus Boy mirrors would be approximately the same as four 8" convex mirrors, if two such mirrors are mounted on the same bracket.

A few commenters believed the rulemaking would result in significant additional costs. Moto Mirror, a mirror manufacturer, stated that the aftermarket cost of a dual set of motorized and heated mirrors would be $362.05. The agency notes that these mirrors include motorized and heated features that the standard does not require. Blue Bird commented that available mirror systems that will meet the proposals have an additional cost of approximately $115 00 per bus above the cost of the standard mirror system it currently uses. R&R Research believed that the cost of installation and adjustment may exceed the cost of the hardware for some mirror systems, but provided no details to support the statement.

After reviewing the available information, NHTSA believes that the NPRM's initial cost estimates are generally reasonable. With respect to System A costs, the agency notes that all buses are typically equipped with supplemental convex driving mirrors as part of their System A mirrors. Thus, no real change in these mirrors would be necessary for school bus users to meet System A requirements. As for R&R Research's concern about installation, the agency has discussed mirror installation with bus manufacturers and State and local school district officials at various school transportation trade shows and has not found any supporting information for R&R's claim.

As to Blue Bird's comment on the $115 difference in the cost for a compliant mirror system, they were referring to a quadrispheric mirror system. They also inadvertently included the cost of the right and left side flat, rearview mirrors as part of the cost increase; this was not appropriate. Blue Bird resubmitted a cost increase of $30 per bus, to the consumer, when equipped with a quadrispheric mirror system rather than the standard four 8" convex cross view mirror system. They further stated that as such mirror

systems gain popularity among the users, that cost will drop.

With regard to Thomas Built's estimate of 80 man hours needed to complete a compliance test of a single bus-seat-mirror combination, it has been the agency's experience, through VRTC, that about ten man hours are necessary to do this type of test. Included in the agency's time estimate are such tasks as locating the cylinders around the bus, adjusting the mirrors, mounting a camera tripod in the driver's seat area, taking slides, processing film, and analyzing slides. The agency's estimate does not include one-time tasks such as setting up a grid of one foot by one foot squares and the constructing the test cylinders. Although many bus-seat-mirror configurations will need to be tested, once a particular configuration has been certified to meet the standard, that configuration will not need to be retested in subsequent years. Therefore, such one-time test costs would be distributed over the years that such a configuration is in use. Also, the agency believes that a limited number of design changes in bus exteriors and/or drivers' seats occur from year to year and any differences in the location of the 25th percentile adult female's eye location that do occur would be small and should not greatly affect the driver's direct or indirect field of view. These eye location differences among seats would, however, establish a compliance "envelope" spanning the eye locations that allow compliance with the standard. Thus, further reductions in time and cost would occur by not having to test any new configurations that would have minute eye location differences between previously tested configurations. Finally, the agency expects that further time savings will occur as more and more tests are performed.

H Leadtime Requirements

The NPRM explained that many mirror systems are now available which would comply with the proposed field-of-view requirements, and thus would not create leadtime constraints from that perspective. Nevertheless, the agency believed that school bus manufacturers and users should be afforded time to investigate and select how they wish to comply with the new field-of-view requirements. Accordingly, the agency proposed an effective date of one year after publication of the final rule.

Several commenters addressed the leadtime necessary for this rulemaking. The NEA favored having the final rule become effective as soon as possible. The Arizona DOT stated that there currently are mirrors that could be used to comply with the one year leadtime requirements. NSTA requested a leadtime of 18 months after publication of the final rule for the effective date, claiming that additional time was necessary to allow school districts to budget for the additional costs associated with the rulemaking.

After reviewing the comments, the agency continues to believe that a one-year leadtime after the final rule's publication provides adequate time for school bus manufacturers and users to determine how to comply with the new field-of-view requirements. The agency notes that most school bus manufacturers are already familiar with all of the brands of mirrors. The extra six months requested by NSTA is not warranted on the basis of other comments.

This final rule does not have any retroactive effect. Under section 103(d) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392(d)), whenever a Federal motor vehicle safety standard is in effect, a State may not adopt or maintain a safety standard applicable to the same aspect of performance which is not identical to the Federal standard Section 105 of the Act (15 U.S.C. 1394) sets forth a procedure for judicial review of final rules establishing, amending or revoking Federal motor vehicle safety standards. That section does not require submission of a petition for reconsideration or other administrative proceedings before parties may file suit in court.

Rulemaking Analyses and Notices

Executive Order 12291 (Federal Regulation) and DOT Regulatory Policies and Procedures

NHTSA has considered the costs and other impacts of this rulemaking, and a Final Regulatory Evaluation (FRE) has been prepared and placed in the docket. Based on this evaluation, the agency has determined that the rulemaking is not "major" within the meaning of Executive Order 12291. However, it is "significant" within the meaning of the Department of Transportation's regulatory policies and procedures.

As explained in the FRE, the additional cost of installing a pair of compliant convex cross view mirrors on a new school bus could range from no cost to as much as $30 per school bus, depending on the type of mirror system selected by the school district. About 38,000 new school buses are sold each year, and according to Blue Bird about 12 percent of all their buses are equipped with a compliant mirror system. Therefore, assuming Blue Bird's sales breakdown is representative of the overall bus manufacturing industry, about 33,440 buses (38,000 × 88 percent) will have to be equipped with a compliant system. Therefore, the aggregate annual cost to consumers would range from no cost to about $1,003,200. (33,400 × $30 per bus).

NHTSA anticipates that the actual costs will likely be nearer the lower end of the estimated cost range for the following reasons. Buyers will probably select lower cost mirrors since they are quite sensitive to cost. At the same time, economies of scale and competition will lower the costs of the more expensive mirrors. The agency further notes that since nearly all States now require school buses to have more mirrors than required by FMVSS No. 111, the costs of complying with this rulemaking could even result in a cost savings for those school buses being sold in jurisdictions where buses are currently equipped with more expensive mirrors than a mirror system that will now be allowed under the amendments.

As mentioned in this notice's "background" section, an average of 26 students are fatally injured and another 283 are injured when struck by their own school bus. While the effectiveness of upgrading the requirements for school bus mirrors cannot be conclusively established, accounts in the NAS report and docket comments indicate that some injuries and fatalities will be avoided.

Regulatory Flexibility Act

NHTSA has considered the effects of this action under the Regulatory Flexibility Act. I hereby certify that it will not have a significant economic impact on a substantial number of small entities. School bus manufacturers are generally not small businesses within the meaning of the Regulatory Flexibility Act. Small governmental units and small organizations are generally affected by amendments to the Federal motor vehicle safety standards as purchasers of new school buses. However, as discussed above, such entities that purchase school buses should see little change with regard to the price of new buses that are equipped with compliant mirrors. In addition, the agency notes that less than six mirror manufacturers provide nearly all of the school bus mirrors in use today. Although they are small companies, each has a full product line, including mirrors that can meet the amended standard. Thus, the likely impact should only be a shift in sales of particular mirror types. Accordingly, the agency has determined that preparation of a

regulatory flexibility analysis is unnecessary.

Executive Order 12612 (Federalism)

This rulemaking has been analyzed in accordance with the principles and criteria contained in Executive Order 12612, and NHTSA has determined that it does not have sufficient federalism implications to warrant preparation of a Federalism Assessment.

In its analysis, the agency considered the amendment's likely effect on the States and possible alternatives to the rulemaking. The agency has determined that virtually all States require school buses to be equipped with more mirrors than current Standard No. 111 requires. As this preamble explained earlier, the amendment provides general performance-oriented requirements that the States may exceed. Although the amendments will supersede the current school bus mirror requirements of a large number of States, any required State regulatory changes will only involve a relatively minor administrative or legislative action that should not require extensive discussion or debate, since the change will improve the level of driver visibility. In addition, because the amendment eliminates current specific requirements which serve to prohibit certain mirror designs, the rulemaking provides additional flexibility to the States. The agency further notes that the amended requirements are similar to the recommendation approved by 86 percent of the State representatives at the 11th National Conference on School Transportation. In addition, State commenters to the NPRM favored the field-of-view requirements. NHTSA accordingly does not expect any significant adverse effect on the States as a result of this rulemaking.

National Environmental Policy Act

NHTSA has also analyzed this rulemaking action for purposes of the National Environmental Policy Act. The agency has determined that implementation of this action will not have any significant impact on the quality of the human environment. Although there will likely be an increase in production of certain mirror types, this increase will not introduce any new or particularly harmful effects to the environment.

List of Subjects in 49 CFR Part 571

Imports, Motor vehicle safety, Motor vehicle.

PART 571—Federal Motor Vehicle Safety Standards

In consideration of the foregoing, 49 CFR part 571 is amended, as follows:

1. The authority citation for part 571 of title 49 continues to read as follows:

Authority: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

§ 571.111 [Amended]

2. In § 571.111, S4 is amended by adding the following definition in alphabetical order.

* * * * *

Effective mirror surface means the portions of a mirror that reflect images, excluding the mirror rim or mounting brackets.

* * * * *

3. In § 571.111, S9 through S9.2(b) is revised and a new S9.3 through S9.4(b)(2) is added, to read as follows:

S9. *Requirements for School Buses.* When a school bus is tested in accordance with the procedures of S13, it shall meet the requirements of S9.1 through S9.4.

S9.1 Outside Rearview Mirrors. Each school bus shall have two outside rearview mirror systems: System A and System B.

S9.2 System A shall be located with stable supports so that the portion of the system on the bus's left side, and the portion on its right side, each:

(a) Includes at least one mirror of unit magnification with not less than 322.60 square centimeters (50 square inches) of reflective surface; and

(b) Includes one or more mirrors which together provide, at the driver's eye location, a view of:

(1) For the mirror system on the right side of the bus, the entire top surface of cylinder N in Figure 2, and of that area of the ground which extends rearward from the mirror surface not less than 60.93 meters (200 feet).

(2) For the mirror system on the left side of the bus, the entire top surface of cylinder M in Figure 2, and of that area of the ground which extends rearward from the mirror surface not less than 60 93 meters (200 feet).

S9.3(a) For each of the cylinders A through P whose entire top surface is not directly visible from the driver's eye location, System B shall provide, at that location:

(1) A view of the entire top surface of that cylinder.

(2) A view of the ground that overlaps with the view of the ground provided by system A.

(b) Each mirror installed in compliance with S9 3(a) shall meet the following requirements:

(1) Each mirror shall have a projected area of at least 258 08 square centimeters (40 square inches), as measured on a plane at a right angle to the mirror's axis.

(2) Each mirror shall be located such that the distance from the center point of the eye location of a 25th percentile adult female seated in the driver's seat to the center of the mirror shall be at least 95.25 centimeters (37.5 inches).

(3) Each mirror shall have no discontinuities in the slope of the surface of the mirror.

(4) Each mirror system shall be installed with a stable support designed to dampen vibration.

(c) Each school bus which has a mirror installed in compliance with S9.3(a) that has an average radius of curvature of less than 88 90 centimeters (35 inches), as determined under S12, shall have a label visible to the seated driver. The label shall be printed in a type face and color that are clear and conspicuous. The label shall state the following:

"USE CROSS VIEW MIRRORS TO VIEW PEDESTRIANS WHILE BUS IS STOPPED. DO NOT USE THESE MIRRORS TO VIEW TRAFFIC WHILE BUS IS MOVING. IMAGES IN SUCH MIRRORS DO NOT ACCURATELY SHOW ANOTHER VEHICLE'S LOCATION."

S9.4(a) Each image required by S9.3(a)(1) to be visible at the driver's eye location shall be separated from the edge of the effective mirror surface of the mirror providing that image by a distance of not less than 3 minutes of arc.

(b) The image required by S9.3(a)(1) of cylinder P shall meet the following requirements:

(1) The angular size of the shortest dimension of that cylinder's image shall be not less than 3 minutes of arc; and

(2) The angular size of the longest dimension of that cylinder's image shall be not less than 9 minutes of arc.

4. Section 571.111 is amended by adding a new S13 through S13.6, to read as follows:

S13. *School bus mirror test procedures.* The requirements of S9.1 through S9.4 shall be met when the vehicle is tested in accordance with the following conditions.

S13.1 The cylinders shall be a color which provides a high contrast with the surface on which the bus is parked.

S13.2 The cylinders are 0.3048 meters (1 foot) high and 0.3048 meters (1 foot) in diameter, except for cylinder P which is 0.9114 meters (3 feet) high and 0.3048 meters (1 foot) in diameter.

S13 3 Place cylinders at locations as specified in S13 3(a) through S13 3(g) and illustrated in Figure 2. Measure the

distances shown in Figure 2 from a cylinder to another object from the center of the cylinder as viewed from above.

(a) Place cylinders G, H, and I so that they are tangent to a transverse vertical plane tangent to the forward-most surface of the bus's front bumper. Place cylinders D, E, F so that their centers are located in a transverse vertical plane that is 1.8288 meters (6 feet) forward of a transverse vertical plane passing through the centers of cylinders G, H, and I. Place cylinders A, B, and C so that their centers are located in a transverse vertical plane that is 3.6576 meters (12 feet) forward of the transverse vertical plane passing through the centers of cylinders G, H, and I.

(b) Place cylinders B, E, and H so that their centers are in a longitudinal vertical plane that passes through the bus's longitudinal centerline.

(c) Place cylinders A, D, and G so that their centers are in a longitudinal vertical plane that is tangent to the most outboard edge of the left side of the bus's front bumper.

(d) Place cylinders C, F, and I so that their centers are in a longitudinal vertical plane that is tangent to the most outboard edge of the right side of the bus's front bumper.

(e) Place cylinder J so that its center is in a longitudinal vertical plane 0.3048 meters (1 foot) to the left of the longitudinal vertical plane passing through the centers of cylinders A, D, and G, and is in the transverse vertical plane that passes through the centerline of the bus's front axle.

(f) Place cylinder K so that its center is in a longitudinal vertical plane 0.3048 meters (1 foot) to the right of the longitudinal vertical plane passing through the centers of cylinders C, F, and I, and is in the transverse vertical plane that passes through the centerline of the bus's front axle.

(g) Place cylinders L, M, N, O, and P so that their centers are in the transverse vertical plane that passes through the centerline of the bus's rear axle. Place cylinder L so that its center is in a longitudinal vertical plane that is 1.8288 meters (6 feet) to the left of the longitudinal vertical plane tangent to the bus's most outboard left surface (excluding the mirror system). Place cylinder M so that its center is in a longitudinal vertical plane that is 0.3048 meters (1 foot) to the left of the longitudinal vertical plane tangent to the left side of the bus. Place cylinder N so that its center is in a longitudinal vertical plane that is 0.3048 meters (1 foot) to the right of the longitudinal vertical plane tangent to the right side of the bus. Place cylinder O so that its center is in a longitudinal vertical plane that is 1.8288 meters (6 feet) to the right of the longitudinal vertical plane tangent to the right side of the bus. Place cylinder P so that its center is in a longitudinal vertical plane that is 3.6576 meters (12 feet) to the right of the longitudinal vertical plane tangent to the right side of the bus.

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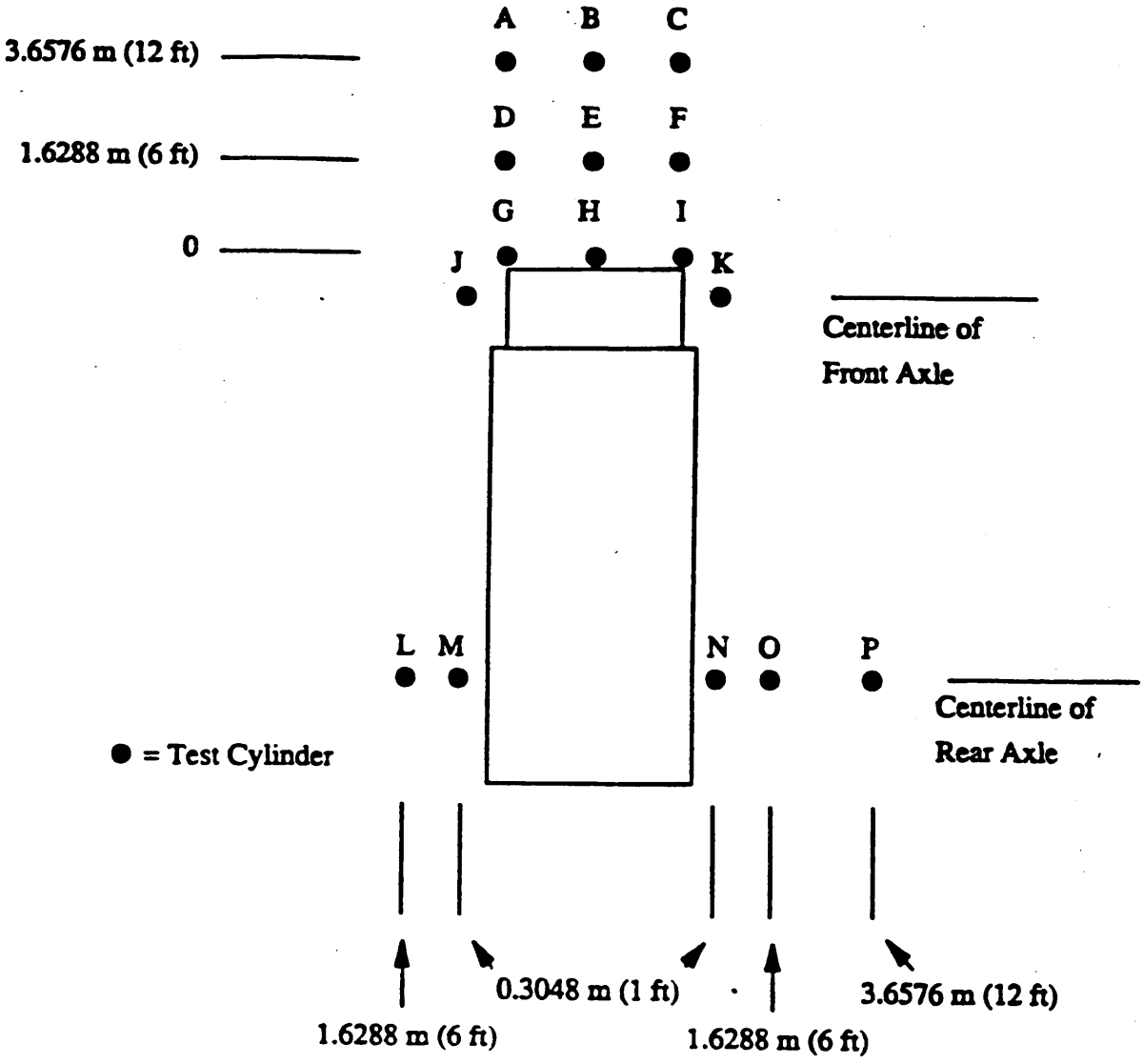

Figure 2.

Location of Test Cylinders for School Bus Field-of-View Test

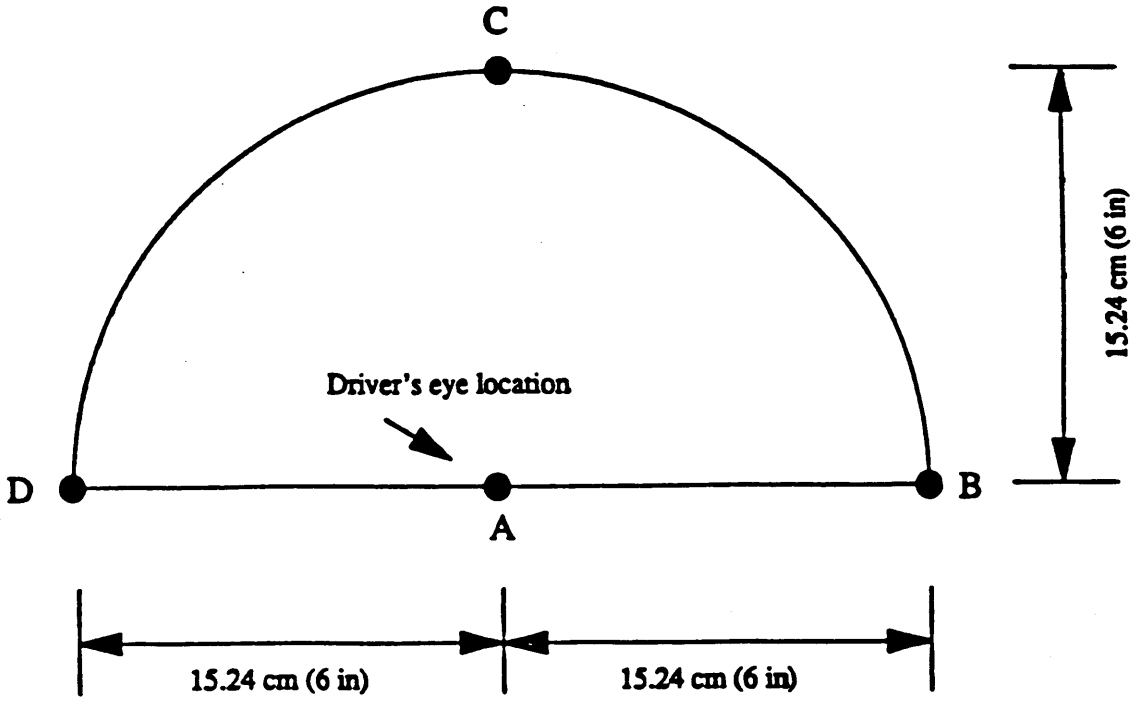

Figure 3.

Camera Locations for School Bus Field-of-View Test

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S13.2 The driver's eye location is the eye location of a 25th percentile adult female, when seated in the driver's seat as follows:

(a) The center point of the driver's eye location is the point located 68.58 centimeters (27 inches) vertically above the intersection of the seat cushion and the seat back at the longitudinal centerline of the seat.

(b) Adjust the driver's seat to the midway point between the forward-most and rear-most positions, and if separately adjustable in the vertical direction, adjust to the lowest position. If an adjustment position does not exist at the midway point, use the closest adjustment position to the rear of the midpoint. If a seat back is adjustable, adjust the seat back angle to the manufacturer's nominal design riding position in accordance with the manufacturer's recommendations.

S13.3 Adjustable mirrors are adjusted before the test in accordance with the manufacturer's recommendations. Such mirrors are not moved or readjusted at any time during the test.

13.4 Place a 35 mm or larger format camera, or video camera, so that its image plane is located at the center point of the driver's eye location or at any single point within a semicircular area established by a 15.24 centimeter (6 inch) radius parallel to and forward of the center point (see figure 3). With the camera at any single location on or within that semicircle look through the camera and the windows of the bus and determine whether the entire top surface of each cylinder is directly visible.

S13.5 For each cylinder whose entire top surface is determined under paragraph 13.4 of this section not to be directly visible at the driver's eye location,

(a) Place a comparison chart (see figure 4) above the mirror that provides the fullest view of the cylinder in situations where a cylinder is partially visible through more than one mirror.

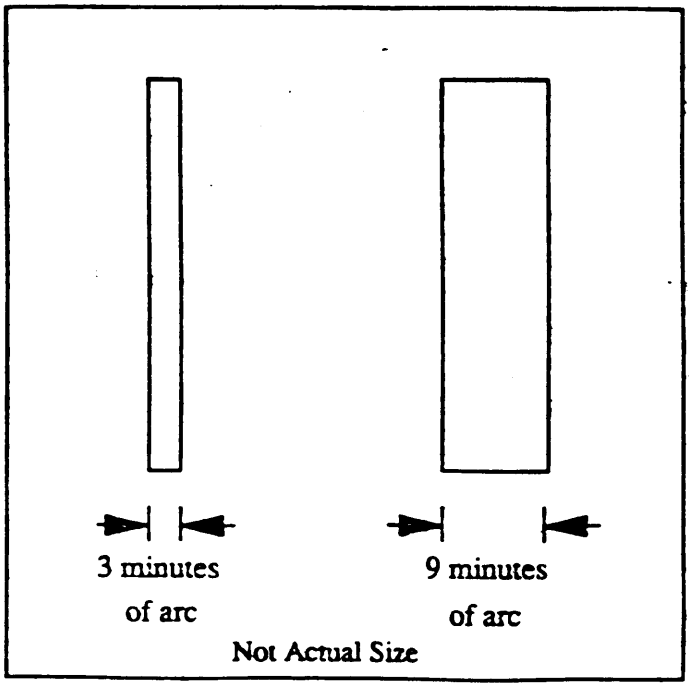

Figure 4.

Comparison Chart for Indirect Field-of-View Measurements

The width of the bars in Figure 4 indicating three minutes of arc and nine minutes of arc are derived from the following formula:

For 3 minutes of arc:

$X=D\times0.000873$,

Where:

X=the width of a line, in the unit of measurement D, representing 3 minutes of arc;

D=distance from center point of driver's eye location to the center of the mirror's surface; and

0.000873=tangent of 3 minutes of arc.

For 9 minutes of arc:

$X=D\times0.002618$,

Where:

X=the width of a line, in the unit of measurement D, representing 9 minutes of arc;

D=distance from center point of driver's eye location to the center of the mirror's surface; and

0.002618=tangent of 9 minutes of arc.

(b) Photograph each cylinder through the mirror(s) that provides a view of the cylinder. Photograph each cylinder with the camera located so that the view through its film or image plane is located at any single location within the semicircle established under 13.4. [POINT A,B,C, OR D] ensuring that the image of the mirror and comparison chart fill the camera's view finder to the extent possible.

13.6 Make all observations and take all photographs with the service/entry door in the closed position and the stop signal arm(s) in the fully retracted position.

Issued on: November 24, 1992.

Marion C. Blakey,

Administrator.

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